

# **IDA**

INSTITUTE FOR DEFENSE ANALYSES

## **The 1998 IDA Cost Research Symposium**

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19981021 038

August 1998

Approved for public release;  
distribution unlimited.

IDA Document D-2173

Log: H 98-002091

This work was conducted under IDA's independent research program and contracts DASW01 94 C 0054/DASW01 97 C 0056, Task T-Q7-1138, for the Office of the Secretary of Defense (Program Analysis and Evaluation). The publication of this IDA document does not indicate endorsement by the Department of Defense, nor should the contents be construed as reflecting the official position of that Agency.

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## **PREFACE**

The Institute for Defense Analyses (IDA) prepared this document as part of a project that is jointly sponsored by IDA's Independent Research Program and the Office of the Director, Program Analysis and Evaluation, in the Office of the Secretary of Defense (OSD). The document contains summaries of ongoing cost research tasks at selected government offices, Federally Funded Research and Development Centers, and military universities. These projects were discussed at a meeting held at IDA on 21 May 1998.

The purpose of the document is to make available the material it contains for the use and convenience of those who participated in the meeting, and for other purposes deemed appropriate by the Chairman of OSD's Cost Analysis Improvement Group. The material has not been evaluated, analyzed, or subjected to formal IDA review.

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## **I. INTRODUCTION**

On 21 May 1998, representatives from selected offices and organizations that sponsor and conduct defense cost research met at a symposium at the Institute for Defense Analyses (IDA) to discuss and exchange information on their current research programs. The symposium was jointly sponsored by IDA and the Cost Analysis Improvement Group (CAIG) in the Office of the Secretary of Defense (OSD). Before the meeting, the representatives were asked to prepare summaries of each cost research study in progress or planned at their offices and organizations. This document catalogs those summaries.

### **A. BACKGROUND**

Several Department of Defense (DoD) offices conduct and sponsor research into methods for estimating and monitoring the costs of defense systems and forces. Such efforts improve the technical capabilities of the DoD to forecast future costs in support of planning, programming, budgeting, and acquisition decisions. The CAIG leads the department in improving capabilities in the cost area. IDA supports the CAIG and other offices in these efforts. One example of such support was IDA's initiation in 1989 of an annual defense cost research symposium. This symposium facilitates the exchange of research findings, leads to avoidance of costly duplication of effort, and allows for more informed and coordinated cost research planning among the DoD offices, Federally Funded Research and Development Centers (FFRDCs), and military universities that independently sponsor cost research.

The charter of the CAIG requires an annual review of the plans of all DoD Components for performing or sponsoring cost research [1]. It also requires development of a six-year plan for DoD cost research that allocates resources to the highest priority, avoids duplication of effort, and facilitates sharing of results among the DoD Components. Further, the CAIG is to make available to all interested DoD Components a data base describing completed, ongoing, and planned cost research projects.

The 1998 IDA Cost Research Symposium helped the CAIG fulfill a portion of these responsibilities. During the symposium, the cost research activities of DoD Components were reviewed and arrangements were made among participants for the exchange of research findings, data, and reports. Each year, IDA produces a catalog of the ongoing cost research activities discussed at the symposium. (This document is an example; References [2 through 10] contain similar information from previous years' symposia.) These documents provide information that

can be valuable to DoD Components and FFRDCs when making research planning and resource allocation decisions.

## B. ABOUT THE SYMPOSIUM

Representatives of IDA and the OSD CAIG jointly prepared the list of offices and organizations invited to participate in the 1998 symposium. Participation included preparation of research project summaries and attendance at the symposium. Table 1 lists the offices and organizations that accepted our invitation and the names of the individuals who represented them at this year's symposium. The abbreviations and ordering of the offices and organizations in Table 1 are used throughout this document.

**Table 1. Participants in the 1998 IDA Cost Research Symposium**

Office/Organization	Abbreviation	Representative
Office of the Director, Program Analysis and Evaluation	PA&E	Dr. David L. McNicol
Ballistic Missile Defense Organization	BMDO	Ms. Donna M. Snead
Army Cost and Economic Analysis Center	CEAC	Mr. Robert W. Young
Army Materiel Command	AMCRM	Mr. Wayne Wesson
Army Tank-automotive and Armaments Command	TACOM	Mr. Richard S. Bazzy
Army Aviation and Missile Command <sup>a</sup>	AMCOM	Mr. Carl L. Story
Army Space and Strategic Defense Command	SMDC	Mr. Jackson G. Calvert
Naval Center for Cost Analysis	NCCA	Dr. Daniel A. Nussbaum
Naval Air Systems Command	NAVAIR	Ms. Maria R. Ponti
Naval Sea Systems Command	NAVSEA	Mr. Jerome R. Acks
Naval Surface Warfare Center, Dahlgren Division	NSWCDD	Mr. John W. Kozicki
Naval Surface Warfare Center, Carderock Division	NSWCCD	Mr. Robert R. Jones
Air Force Cost Analysis Agency	AFCAA	Mr. Joseph T. Kammerer
Aeronautical Systems Center, Air Force Material Command	ASC/FMC	Ms. Kathy L. Watern
Air Force Space and Missile Systems Center	AFSMC	Mr. Anthony E. Finefield
Electronics Systems Center, Air Force Material Command	ESC/FMC	Ms. Ellen Coakley
Ministry of Defence, Special Procurement Services/Cost Forecasting	SPS/CF	Mr. Terry Proffitt
Air Force Institute of Technology	AFIT/LAS	MAJ Daryl Hauck
Defense Systems Management College	DSMC	LTC Melinda Walsh
Aerospace Corporation	AERO	Dr. Stephen A. Book
MITRE Corporation	MITRE	Mr. Stephen Gross
RAND Corporation	RAND	Mr. Frederick S. Timson
Logistics Management Institute	LMI	Mr. Walter R. Cooper
Center for Naval Analyses <sup>a</sup>	CNA	Mr. Doug Adams
Institute for Defense Analyses	IDA	Dr. Stephen J. Balut

<sup>a</sup> These two offices/organizations did not submit project summaries this year.

The symposium was held in the spring to correspond with the CAIG's schedule for updating the DoD's Six-Year Cost Research Plan [11 and 12]. Budget decisions related to such studies are usually made during the summer. These decisions will be better informed because they will be made in light of the information disseminated at the symposium and contained in this document.

The agenda for the 1998 symposium is shown in Table 2.

**Table 2. Agenda**

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<b>Welcome</b>
Dr. Stephen J. Balut, <i>Institute for Defense Analyses</i>
<b>Keynote Address</b>
Dr. David L. McNicol, <i>Cost Analysis Improvement Group</i>
<b>Background</b>
Dr. Stephen J. Balut, <i>Institute for Defense Analyses</i>
<b>Fixed Wing Aircraft</b>
Ms. Theresa O'Brien, <i>Air Force Cost Analysis Agency</i>
<b>Rotary Wing Aircraft</b>
Ms. Theresa O'Brien, <i>Air Force Cost Analysis Agency</i>
<b>Electronics</b>
Mr. Richard Collins, <i>Naval Center for Cost Analysis</i>
<b>Information Systems</b>
Mr. Richard Collins, <i>Naval Center for Cost Analysis</i>
<b>Ships</b>
Mr. Richard Collins, <i>Naval Center for Cost Analysis</i>
<b>Missiles</b>
Mr. Richard Bishop, <i>Army Cost and Economic Analysis Center</i>
<b>Ground Vehicle Systems</b>
Mr. Richard Bishop, <i>Army Cost and Economic Analysis Center</i>
<b>Space Systems</b>
Ms. Theresa O'Brien, <i>Air Force Cost Analysis Agency</i>
<b>Ordnance</b>
Mr. Richard Bishop, <i>Army Cost and Economic Analysis Center</i>
<b>Forces/Infrastructure</b>
Mr. Donald Tison, <i>Office of Secretary of Defense (PA&amp;E)</i>
<b>Roadmap</b>
Dr. Vance Gordon, <i>Office of Secretary of Defense (PA&amp;E)</i>
<b>Cost of Stealth</b>
Dr. J. Richard Nelson, <i>Institute for Defense Analyses</i>

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Following the Keynote Address by David McNicol, Chairman of the OSD CAIG, Stephen Balut of IDA set the stage for a sequence of nine presentations provided by Theresa O'Brien of the Air Force Cost Analysis Agency, Richard Bishop of the Army Cost and Economic Analysis Center, and Richard Collins of the Naval Center for Cost Analysis. These presentations

paralleled and built on related presentations given at the 31<sup>st</sup> Annual DoD Cost Analysis Symposium (DoDCAS) conducted on February 3–6, 1998, in Williamsburg, Virginia. At the DoDCAS in February, these same representatives from the Military Departments described the status of DoD's ability to estimate the costs of weapon systems [13] by different commodity groups (e.g. aircraft, missiles, ships). Capabilities were assessed at each major milestone for major work breakdown structure (WBS) elements. Weaknesses were highlighted and identified as areas requiring additional research effort. At the symposium in May, those assessments were summarized and the speakers identified ongoing research tasks that addressed the areas of weakness.

The commodity group presentations were followed by a presentation by Donald Tison, Director of OSD's Force and Infrastructure Cost Analysis Division, that addressed ongoing research in the forces and infrastructure areas. Then Vance Gordon, cost analyst in the OSD CAIG, placed the supply of ongoing research, as discussed by earlier presenters, into perspective with the demand for cost research, as indicated by upcoming Defense Acquisition Board milestone reviews. The final presentation of the day was provided by J. Richard Nelson of IDA on the subject of the cost to build stealth characteristics into weapon systems.

### C. USING THE CATALOG

This document was designed to facilitate a search for information on a specific topic. This is how the document's pertinent sections can be used:

- *Table 3, Keyword Assignments.* In the table, the rows represent keywords and the columns represent offices and organizations. The number at the intersection of a row and column is the number of studies by the office or organization (column) that have the keyword (row) associated with them.
- *Section II, Study Titles.* This section lists the study titles for tasks summarized in Section III. The titles, grouped according to the office or organization performing the study, appear in the order in which they were submitted to IDA.
- *Section III, Summaries.* This section is divided into subsections, one for each office and organization that contributed project summaries. The first part of each section describes the office or organization (name, location, director,<sup>1</sup> size, etc.).<sup>2</sup> Following that are summaries of research tasks the office or organization reported as being in progress or planned at the time of the symposium. Near the end of each summary is a list of keywords the director of the office or organization assigned to the task. (In several cases, the author modified the keywords for consistency.)

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<sup>1</sup> Though their actual titles vary, the heads of the offices/organizations are referred to as "directors" in this document.

<sup>2</sup> This description is absent if the office/organization did not provide one.

Finding tasks on a specific topic is accomplished as follows: (1) scan the row representing the topic in Table 3 to identify the offices and organizations that are conducting studies on that topic; (2) scan the list of study titles for those offices and organizations in Section II; and (3) refer to the appropriate summaries in Section III.

#### **D. HOW TASKS COMPARE TO THE PLAN**

Some readers may be interested in how the tasks in this catalog align with the topics listed in the latest version of the Six-Year Cost Research Plan. Tables 4 and 5 have been included for this purpose. Table 4 lists the research categories first presented in January 1993 [11] and later modified in April 1993 [12]. The participating offices and organizations assigned the relevant numeral-letter-number codes from Table 4 to each of their tasks. Table 5 shows the number of projects in each category by office/organization.

Table 3. Keyword Assignments

PERSPECTIVE	PA&E	BMDO	CEAC	AMCRM	TACOM	SMDC	NCCA	NAVAIR	NAVSEA	NSWCDD	NSWCDD	AFC&A	ASC/FMC	AFSMC	ESC/FMC	SPS/CF	AFT/LAS	DSMC	AERO	MITRE	RAND	LMI	IDA	TOTAL	
Industry	5	2	—	—	—	—	1	5	6	—	1	2	1	—	2	—	1	1	1	—	1	1	6	36	
Government	13	3	22	1	1	—	26	13	6	2	10	16	6	5	6	2	21	1	1	6	—	9	29	199	
CONTEXT																									
Estimating	6	5	18	—	1	3	17	8	7	2	4	12	5	5	5	2	8	—	—	5	3	2	10	13	141
Analysis	4	—	18	1	—	—	13	7	6	—	9	15	4	—	4	—	15	—	—	—	2	1	9	14	122
Reviewing/Monitoring	3	—	—	—	—	—	—	—	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	8
Policy	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	2	—	—	1	—	—	6	11	
Programming	4	—	—	—	—	—	2	—	1	—	—	—	—	—	—	—	—	—	—	—	1	9	13	32	
Budgeting	—	—	4	—	—	—	2	—	2	—	1	—	—	—	—	—	1	—	—	—	—	9	4	23	
OBJECT																									
Forces	5	—	4	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	
Weapon Systems	4	5	7	1	1	—	4	4	1	—	1	7	4	1	6	1	3	—	—	—	—	3	14	29	
Aircraft	1	—	2	—	—	—	4	12	1	—	—	7	3	1	—	—	5	—	—	—	—	—	4	54	
Helicopters	—	—	—	—	—	—	1	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	40	
Missiles	—	—	1	—	—	3	6	2	—	2	—	6	—	1	—	—	1	—	—	—	1	—	3	26	
Ships	—	—	—	—	—	—	3	—	8	—	7	—	—	—	—	1	—	—	—	—	—	—	1	20	
Land Vehicles	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	3	
Space Systems	—	—	1	—	—	—	1	—	1	—	—	4	1	5	—	—	1	—	—	4	1	—	2	19	
Airframe	—	—	—	—	—	—	—	2	—	—	—	1	1	—	—	—	—	—	—	—	—	1	7	6	
Propulsion	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Electronics/Avionics	—	—	3	—	—	3	8	8	2	—	2	1	4	1	4	—	1	—	—	2	1	1	—	41	
Spares/Logistics	—	—	—	—	—	—	—	3	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	5	
Facilities	2	—	3	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	—	3	10		
Infrastructure	—	—	5	—	—	—	3	—	1	—	—	1	—	—	—	—	—	—	—	—	—	3	4	17	
Manpower/Personnel	—	—	1	—	—	—	2	1	—	—	—	—	—	—	1	—	1	—	—	—	—	1	3	11	
STAGE																									
Concept Development	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	10	
Demonstration/Validation	3	—	—	—	—	—	1	—	—	—	6	—	1	—	—	1	1	—	—	—	—	—	—	8	
EMD	3	1	—	—	—	—	8	5	—	2	2	6	3	3	2	—	4	—	—	—	—	—	7	45	
Production	3	—	—	—	—	—	7	5	5	2	2	7	2	3	—	—	2	—	2	—	1	1	8	50	
Test and Evaluation	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	2	4	
Operations and Support	—	1	4	—	—	—	12	6	—	—	2	1	—	1	—	—	7	—	—	—	1	2	8	45	
Retirement and Demilitarization	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	
Life Cycle	3	3	—	1	1	—	4	3	2	—	4	11	3	1	—	—	4	—	2	1	—	—	8	51	
FOCUS																									
Labor	2	—	—	—	—	—	1	4	3	—	5	8	—	—	2	—	3	—	1	—	—	—	2	31	
Material	3	—	—	—	—	—	1	2	4	—	4	8	—	—	—	—	—	—	—	—	—	—	1	24	
Overhead/Indirect	2	—	—	—	—	—	—	3	—	—	4	2	—	—	1	—	1	—	—	—	1	—	5	18	
Engineering	1	1	—	—	—	—	—	1	4	—	2	—	3	—	1	—	—	—	3	—	—	—	1	18	
Manufacturing	—	—	—	—	—	—	1	2	2	—	4	3	3	—	1	—	—	—	—	—	1	1	2	19	
CPR/CCDR	—	—	2	—	—	—	1	—	—	—	—	—	—	—	1	—	3	—	—	—	—	—	—	8	
WBS	—	—	1	—	—	—	—	—	5	—	1	—	—	4	—	—	—	—	—	—	—	—	2	13	

(Continued on the next page.)

Table 3—Continued

	P&E	BMD	CEAC	AMCRM	TACOM	SMD	NCA	NAVAIR	NAVSEA	NSWCDD	NSWCDD	AFCAL	ASCFMC	AFSMC	ESC/FMC	SPS/CF	AFT/LAS	DSMC	AERO	MITRE	RAND	LMI	IDA	TOTAL
<b>FOCUS (continued)</b>																								
Fixed Costs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Variable Costs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Production Rate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Acquisition Strategy	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Automation	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Advanced Technology	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Risk/Uncertainty	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Training	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Readiness	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Reliability	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sustainability	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Integration	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Modification	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Security	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Environment	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Schedule	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Size	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Software	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>APPROACH</b>																								
Data Collection	4	—	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Survey	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Case Study	1	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mathematical Modeling	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Economic Analysis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cost/Production Function	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Time Series	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Statistics/Regression	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>PRODUCT</b>																								
Data Base	4	1	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Review	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Method	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mathematical Model	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Computer Model	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Expert System	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cost Progress Curve	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CER	—	1	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Study	5	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**Table 4. Research Categories**

---

**I. Themes for Special Emphasis**

- A. Measuring the savings from Acquisition Streamlining
- B. Cost estimating techniques for the new acquisition environment
  - 1. Selective upgrading of existing systems
  - 2. Selective low-rate procurements
- C. Cost estimation for Major Defense Acquisition Programs (MDAPs) in the EMD stage
  - 1. Methods for highlighting dependency on new technologies that either will become significant cost items in their own right or may set the pace of the program
  - 2. Techniques for determining technical and schedule uncertainties in ways that facilitate rational evaluation of their cost impact
- D. Techniques for estimating environmental cost throughout an MDAP's life cycle

**II. Maintenance-of-the-toolbox themes**

- A. Sustain the effectiveness of established tools
    - 1. Updates to incorporate recent experience
    - 2. Improvements to broaden scope or enhance methods
  - B. Incorporate new analysis techniques
  - C. Make progress on difficult problems that previously have eluded solution
  - D. Explore new ideas to establish their suitability for improving cost analysis
-



Table 5. Tabulation by Research Category

	PA&E	BMDO	CEAC	AMCRM	TACOM	SMDC	NCCA	NAVVAIR	NAVSEA	NSWCDD	NSWCDD	AFCAA	ASC/FMC	AFSMC	ESC/FMC	SPS/CF	AFT/LAS	DSMC	AERO	MITRE	RAND	LMI	IDA	TOTAL
I	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
IA	—	—	—	—	—	—	—	2	—	—	—	—	1	—	—	—	2	—	—	—	—	1	—	6
IB	1	—	—	—	—	—	—	—	1	—	—	2	—	—	1	—	2	1	2	—	—	—	1	11
IB.1	—	—	1	—	—	—	1	1	—	—	—	1	1	—	—	—	—	—	—	—	—	—	3	8
IB.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
IC	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	3
IC.1	2	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	4
IC.2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	4	6
ID	1	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	1	4
II	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	3
IIA	1	—	—	—	—	—	1	3	1	—	1	3	2	—	—	—	—	—	2	—	—	9	3	26
IIA.1	1	—	18	1	—	—	11	5	1	—	1	1	1	2	—	—	9	—	1	—	—	—	12	65
IIA.2	4	7	16	1	—	3	12	3	2	—	5	10	—	4	—	—	5	—	1	—	1	1	13	88
IIB	—	—	1	—	1	—	6	5	3	—	6	5	2	1	3	—	2	—	2	2	—	—	—	50
IIC	4	—	2	—	—	—	13	1	2	2	1	2	—	—	1	2	1	—	3	—	1	1	10	46
IID	—	—	—	—	—	—	6	—	1	—	3	—	—	1	—	—	6	—	4	1	—	1	2	25

## II. STUDY TITLES

### *Office of the Director, Program Analysis and Evaluation*

PA&E-1	Force and Support Cost (FSC) System
PA&E-2	Force and Support Cost (FSC) System and FYDP Support—VGS
PA&E-3	Visibility and Management of Operating and Support Costs (VAMOSC) for Major Weapon Systems
PA&E-4	Visibility and Management of Operating and Support Costs (VAMOSC) for Major Weapon Systems
PA&E-5	Improved Software Cost Reporting Processes for Weapon Systems
PA&E-6	Selected Acquisition Report (SAR) Cost Variance Analysis
PA&E-7	Demilitarization and Disposal Costs of Tactical Aircraft
PA&E-8	Developing Cost Estimating Relationships for the Streamlined Manufacturing Environment
PA&E-9	IDA Cost Research Symposium
PA&E-10	Cost Analysis of Advanced Materials
PA&E-11	Cost of Developing and Producing Next Generation Tactical Aircraft
PA&E-12	Contractor Cost Data Reporting (CCDR) Clearinghouse/Repository
PA&E-13	CAIG Information Center Support
PA&E-14	Improved Methodology for Projection of Development Costs

### *Ballistic Missile Defense Organization*

BMDO-1	Automated CER Data Base
BMDO-2	BMDO Operating & Support Cost Estimating
BMDO-3	BMDO Cost Risk Research
BMDO-4	Cost Drivers Analysis
BMDO-5	Fixed Site Early Warning Radars
BMDO-6	Development CERS
BMDO-7	EMD Learning Slope and the Prototype to Production Step-Down Factor

### *Army Cost and Economic Analysis Center*

CEAC-1	Update FORCES Cost Model, EFCDB, Cost Factor Handbook
CEAC-2	Crosswalk ISR Cost Factors into FORCES Cost Model
CEAC-3	FORCES Deployment Cost Model
CEAC-4	Installation Status Report (ISR) Part1, (Infrastructure) Revision and Update
CEAC-5	The Army Manpower Cost System (AMCOS)
CEAC-6	ACEIT/ACDB
CEAC-7	Communications and Electronics Cost Data Base/Methodology
CEAC-8	Operating and Support Management Information System (OSMIS) Data Base Management
CEAC-9	Operating and Support Management Information System (OSMIS) Output Products

CEAC-10	Operating and Support Management Information System (OSMIS) Special Studies
CEAC-11	Aircraft Module Data Base Migration and Methodology Enhancement
CEAC-12	Missile Module of ACDB
CEAC-13	Wheel and Tracked Combat Vehicle Data Base and Methodology Development
CEAC-14	Performance Affordability Assessment Model (PAAM)
CEAC-15	Standard Service Costing (SSC)
CEAC-16	Leadership Training Materials for Activity Based Cost (ABC)
CEAC-17	Standard Service Costing (SSC) FY98 Cost Factors
CEAC-18	ACEIT Economic Analysis Applications
CEAC-19	ACEIT WIN Enhancements
CEAC-20	ACDB Enhancements
CEAC-21	Development of Leadership Resources for Activity Based Costing (ABC)
CEAC-22	Link Activity Based Costs (ABC) to Service Based Costs (SBC)
CEAC-23	Aircraft Module Data Base Transition

#### ***Army Materiel Command***

AMCRM-1      ACE-IT Verification and Validation Tool

#### ***Army Tank-Automotive and Armaments Command***

TACOM-1      Performance Affordability Assessment Model (PAAM)

#### ***Army Space and Strategic Defense Command***

SMDC-1      Software Cost Estimating  
SMDC-2      Laser Research  
SMDC-3      Multi-Mode Seeker Cost Research

#### ***Naval Center for Cost Analysis***

NCCA-1      Top-Level Ship Operating and Support Cost Model  
NCCA-2      Ship Operating and Support Cost Analysis Model (OSCAM-Ship)  
NCCA-3      Shipboard Systems Operating and Support Cost Analysis Model (OSCAM-Sys)  
NCCA-4      Aircraft Operating and Support Cost Model  
NCCA-5      Avionics Operating Support Cost Model  
NCCA-6      Missile Torpedo Operating and Support Cost Model  
NCCA-7      Cost of a Sailor Study  
NCCA-8      Cost of Manpower Estimating Tool (COMET)  
NCCA-9      Integration of Navy VAMOSC Database into a Relational Database Management System  
NCCA-10      Expansion of VAMOSC Shipboard System Database  
NCCA-11      Indirect Cost Database Related to the VAMOSC Database  
NCCA-12      Linkage Between VAMOSC and the PPBS  
NCCA-13      Platform Integration Cost Database/Model for Electronics  
NCCA-14      Government In-House Cost Database/Estimating Methodology  
NCCA-15      Missile Special Tooling and Test Equipment Cost Estimating Relationship

NCCA-16	Rotary Wing Aircraft Cost Database
NCCA-17	Missile Development Cost Estimating Method
NCCA-18	Electronics/Cost Technical Database
NCCA-19	MADCAM (Microwave and Digital Cost Analysis Model)
NCCA-20	Transmit/Receive (T/R) Module Update
NCCA-21	Software Development Estimating Handbook - Phase One
NCCA-22	Weapon System Software Development Cost/Technical Database
NCCA-23	Weapon System Software Development Estimating Methodology Update
NCCA-24	Weapon System Software Maintenance Cost/Technical Database Estimating Methodology
NCCA-25	Automated Information System (AIS) Software Development Estimating Methodology
NCCA-26	Price Indices for Computers
NCCA-27	Commodity Investment Balance Assessment (CIBA) Model

### *Naval Air Systems Command*

NAVAIR-1	Joint Strike Fighter (JSF) Advanced Cost Analysis Support (Cost of Stealth)
NAVAIR-2	Naval Aviation Modification Model (NAMM) Data Base
NAVAIR-3	Maintenance Trade Decision Support System
NAVAIR-4	Maintenance Trade Guidebook
NAVAIR-5	NAVAIR Operating and Support Cost Model
NAVAIR-6	SBIR Life Cycle Cost Model Development
NAVAIR-7	System Engineering/Program Management Cost for Missile Development and Production
NAVAIR-8	Aircraft Learning Curve Trends Over Time
NAVAIR-9	Production Cross Checks for Fighter Aircraft and Helicopters
NAVAIR-10	Data for Propulsion O&S Model
NAVAIR-11	Platform Integration Study
NAVAIR-12	Commodity Specific Escalation Indices
NAVAIR-13	Life Cycle Cost Simulation Model
NAVAIR-14	Estimating Avionics Program Support Costs for Engineering and Manufacturing Development Contracts

### *Naval Sea Systems Command*

NAVSEA-1	Private Shipbuilder Overhead Costs and Savings from Initiatives
NAVSEA-2	Shipbuilding Process Simulation Model
NAVSEA-3	Early Warning System (EWS) Integration
NAVSEA-4	Material Vendor Survey
NAVSEA-5	AACEI Cost Model for Aircraft Carriers
NAVSEA-6	SEA 0177 Shipyard Workload Model Improvements
NAVSEA-7	COTS Electronic Technology Assessment/Refresh Cost Model
NAVSEA-8	Total Ownership Cost Reduction Process and Templates
NAVSEA-9	Government Furnished Equipment/Materiel (GFE/GFM) Process Improvement Initiative

***Naval Surface Warfare Center, Dahlgren Division***

NSWCDD-1	TBMD Missile Model
NSWCDD-2	RDT&E Development Support CERs for Radar Programs

***Naval Surface Warfare Center, Carderock Division***

NSWCCD-1	Cost Module for Sealift Ship Version of ASSET
NSWCCD-2	Product-Oriented Design and Construction (PODAC) Cost Model
NSWCCD-3	Surface Combatant Performance-Based Life Cycle Cost Model (PBCM)
NSWCCD-4	Navy Force Affordability Model (NFAM)
NSWCCD-5	Nuclear Attack Submarine Technology-Based Parametric Cost Model
NSWCCD-6	Analysis of Operation and Support (O&S) Costs for Aircraft Carriers
NSWCCD-7	Aircraft Carrier Performance-Based Life Cycle Cost Model and Present Value Analysis Modeling
NSWCCD-8	Arsenal Ship Operating and Support Cost Model
NSWCCD-9	Aircraft Carrier Cost-Benefit Analysis Model
NSWCCD-10	USCG Performance-Based Life Cycle Cost Model

***Air Force Cost Analysis Agency***

AFCAA-1	NAFCOM
AFCAA-2	Crosslinks Payload Data Collection and CER Development
AFCAA-3	Missiles ACDB Update
AFCAA-4	Below-the-Line Cost Study for Missiles and Munitions
AFCAA-5	Weapon System Case Growth Study
AFCAA-6	Below-the-Line In-House Cost Research Study
AFCAA-7	Multi-Aircraft Database Normalization
AFCAA-8	Price H Composite Material Calibration
AFCAA-9	Aircraft Database Study Follow-On
AFCAA-10	Avionics Systems Data Collection
AFCAA-11	Overhead Study
AFCAA-12	Long Range Planning O&S Cost Models
AFCAA-13	Integrated Force and Infrastructure Cost Model (IFICM)
AFCAA-14	Force Analysis Decision Support System ACEIT Enhancements
AFCAA-15	Air Force Total Ownership Cost (AFTOC)
AFCAA-16	ACEIT Upgrades/RISK Integration

***Air Force Materiel Command/Aeronautical Systems Center***

ASC/FMC-1	Advanced Aircraft Cost Forecasting Model (AAFCM)
ASC/FMC-2	Automated Model for Integrating Cost with Operational Effectiveness
ASC/FMC-3	PRICE Model Calibration Studies
ASC/FMC-4	Integrated Desktop Analysis and Planning System (IDAPS) Concept Evaluation (ICE)
ASC/FMC-5	Case Study, APG-63 V(1) Radar, F-15
ASC/FMC-6	Avionics Support Cost Factors Update

### ***Air Force Space and Missile Systems Center***

AFSMC-1	Hazardous Materials Disposal Cost Study
AFSMC-2	Operations and Support (O&S) Database
AFSMC-3	Passive Sensor Cost Model Update
AFSMC-4	Software Database
AFSMC-5	Unmanned Spacecraft Cost Model (USCM) Update

### ***Air Force Electronics Systems Center***

ESC/FMC-1	Labor Analysis Process & Automation for Estimating & Proposal Evaluation
ESC/FMC-2	Use of Automated Cost Estimator-Integrated Tools (ACE-IT) for Cost Proposal Evaluation and the Storage of Cost/Schedule/Technical Data
ESC/FMC-3	Industry/Government C <sup>2</sup> Cost Working Group
ESC/FMC-4	C <sup>2</sup> Cost Information Center Web Site
ESC/FMC-5	"Open" Estimating Tool for Software-Intensive Programs with COTS H/W & S/W
ESC/FMC-6	"NOW" Data Collection Process & Analysis

### ***Ministry of Defence, Special Procurement Services/Cost Forecasting***

SPS/CF-1	Software Support Cost Model Project (SSCMP)
SPS/CF-2	Operating and Support Costs Analysis Models (OSCAM)

### ***Air Force Institute of Technology***

AFIT/LAS-1	Calibration and Validation of the Cocomo Ii. 1997.0 Cost/Schedule Estimating Model to the Space and Missiles Systems Center Database
AFIT/LAS-2	A Cost-Benefit Analysis of Earned Value Management Systems Criteria
AFIT/LAS-3	An Examination of the Demographics and Career Progression of Air Force Institute of Technology Cost Analysis Graduates
AFIT/LAS-4	The Determinants of the Housing Choices of Military Families: Implications for Military Policy
AFIT/LAS-5	Factors Affecting the Unit Cost of Weapon Systems
AFIT/LAS-6	Calibration and Validation of the Sage Software Cost/Schedule Estimating System to United States Air Forces Databases
AFIT/LAS-7	Calibration and Validation of the Checkpoint Model to the Air Force Electronic Systems Center Software Database
AFIT/LAS-8	A Study of Historical Inflation Forecasts Used in the Department of Defense Future Years Defense Program
AFIT/LAS-9	Tracking Overhead Orta Costs in Technology Transfer Activities
AFIT/LAS-10	The Impact of the Packard Commission's Recommendations on Reducing Cost Overruns in Major Defense Acquisition Programs
AFIT/LAS-11	Estimating KC-137 Aircraft Ownership Costs in the Brazilian Air Force (BAF)
AFIT/LAS-12	Economic Analysis for an F-22 Organic vs. Contractor Aircraft Battle Damage Repair Ownership Decision
AFIT/LAS-13	A Preliminary Study of Using the SEI's Capability Maturity Model to Set Statistical Control Bounds on DoD Contractor Cost and Schedule Performance
AFIT/LAS-14	Cost Per Flying House Analysis of the C-141

AFIT/LAS-15	Activity-Based Costing in Logistics
AFIT/LAS-16	A Return on Investment Model for Technology Transfer
AFIT/LAS-17	Multinational Communications Satellite Cost Study
AFIT/LAS-18	Fighter CERS and Seemingly Unrelated Regressions
AFIT/LAS-19	Software Support Cost Estimating Models: a Comparative study of What the Models Estimate
AFIT/LAS-20	A Quantitative Cost Analysis of the First High Altitude Endurance Unmanned Aerial Vehicle – the Global Hawk
AFIT/LAS-21	Predictive Reliability of the Contractor Performance Assessment Report (CPAR) Process
AFIT/LAS-22	Cost/Benefit Analysis of Air Refueling Options for the North Pacific Theatre

### ***Defense Systems Management College***

DSMC-1	Research on Ongoing Acquisition Research (ROAR)
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### ***Aerospace Corporation***

AERO-1	Costs of Space, Launch, and Ground Systems
AERO-2	Validation Testing of Commercial Risk-Analysis Software
AERO-3	Small-Satellite Cost Engineering Model
AERO-4	Small-Satellite Cost Study
AERO-5	Ground Systems Cost Model
AERO-6	Formation of Corporate Concept Design Center

### ***MITRE Corporation***

MITRE-1	A Predictive Pricing Model for Asynchronous Transfer Mode (ATM) Public Services
MITRE-2	G-Cost Model
MITRE-3	Trends in the Development of Optoelectronics over the Next Ten to Fifteen Years

### ***RAND Corporation***

RAND-1	Force Structure and Support Infrastructure Costing for Program Analysis and Evaluation
RAND-2	The Cost of Future Military Aircraft: Historical Cost Estimating Relationships and Cost Reduction Initiatives

### ***Logistics Management Institute***

LMI-1	Empirical Analysis of Learning Curves
LMI-2	Improved Methodologies for Estimating Development Costs
LMI-3	Applying Advanced Tools for Analysis of Program Management
LMI-4	Enhancing Resource Analysis
LMI-5	Weapon System Total Life Cycle Costs: A Management-Oriented Cost Accounting System
LMI-6	Metrics for Business Area Programming

LMI-7	Understanding the Costs of Logistic Support and Interoperability for NATO Enlargement
LMI-8	Improving DBOF Pricing
LMI-9	Analysis of Institutional Training Resources
LMI-10	Accrual Accounting for Post-Retirement Military Health Care

***Institute for Defense Analyses***

IDA-1	Defense Resource Management Cost Model
IDA-2	FYDP Tracking and Analysis System
IDA-3	FYDP Related Studies
IDA-4	Defense Programming Database
IDA-5	Science and Technology Models
IDA-6	Contingency Operations Support Tool (COST)
IDA-7	Trends in Weapons System O&S Costs
IDA-8	Operations and Maintenance (O&M) Funding Migration
IDA-9	Assessing Defense Funding Supporting Readiness
IDA-10	Force Modernization Metrics
IDA-11	Non-major Procurement Funding
IDA-12	Program Objective Memorandum (POM) Major Defense Acquisition Program (MDAP) Reporting
IDA-13	Force Aging
IDA-14	USMC Utility Rotary Wing Aircraft
IDA-15	Rotary Wing Aircraft Recapitalization Analyses
IDA-16	DoD Helicopter Commonality Study
IDA-17	Space and Missiles Systems Nuclear Hardening Costs
IDA-18	Cost of Stealth
IDA-19	Affordable Multi-Missile Manufacturing (AM3)
IDA-20	Technical and Schedule Risk Assessments for Tactical Aircraft Programs
IDA-21	Methods to Assess Schedules for the Strategic Defense System
IDA-22	Resource Analysis for Test and Evaluation
IDA-23	Program Risk Analysis and Management
IDA-24	Evaluation of TRICARE Program Costs
IDA-25	Financial Databases of Defense Manufacturers
IDA-26	Economic Drivers of Defense Overhead Costs
IDA-27	DSAMS Cost Estimating
IDA-28	Active/Reserve Integration
IDA-29	Reducing Defense Infrastructure Costs
IDA-30	Environmental Costs, Unexploded Ordnance Remediation
IDA-31	Defense Economic Planning and Projection Systems (DEPPS)
IDA-32	Coast Guard Models
IDA-33	Cost Analysis Education



**OFFICE OF THE DIRECTOR,  
PROGRAM ANALYSIS AND EVALUATION**

<b><i>Name</i></b>	Office of the Deputy Director (Resource Analysis) Program Analysis and Evaluation	
<b><i>Address</i></b>	OSD(PA&E) 1800 Defense Pentagon Washington, DC 20301-1800	
<b><i>Director</i></b>	Dr. David L. McNicol, (703) 695-0721	
<b><i>Size</i></b>	Professional:	36
	Support:	5
	Consultants:	1
	Subcontractors:	17
<b><i>Focus</i></b>	Cost Analysis Improvement Group (CAIG); Life-Cycle Costs of Major Defense Acquisition Programs; Force Structure; Operating and Support Costs; Economic Analysis	
<b><i>Activity</i></b>	CAIG reviews and studies per year:	30-40
	POM, budget, FYDP reviews:	As required

**PA&E-1**

**Title:** Force and Support Cost (FSC) System

**Summary:** DoD needs a quick and accurate cost estimating tool for proposed changes in forces and support infrastructure. OSD(PA&E) must supply rapid, credible, and incisive evaluations of the likely budget effects of major force and infrastructure alternatives in support of the program/budget review process. This project designs and implements an analysis system to address these fundamental issues.

**Classification:** Unclassified

**Sponsor:** OSD(PA&E)  
FICAD  
The Pentagon, Room 2D278  
Washington, DC 20301  
Donald Tison, (703) 697-4311

**Performer:** RAND

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	96	\$375,000	
	97	\$550,000	
	98	\$550,000	

**Schedule:** Start End  
Ongoing

**Data Base:**

**Publications:** TBD

**Category:** II.C

**Keywords:** Government, Programming, Forces, Life Cycle, Acquisition Strategy, Mathematical Modeling, Computer Model

**PA&E-2**

**Title:** Force and Support Cost (FSC) System and FYDP Support—VGS

**Summary:** This project is the O&M adjunct to the RDT&E funded research and development effort (see PA&E-1). The O&M funding provides software maintenance of portions previously developed. FSC must be imported from Ingres to ORACLE and from Excel 4.0 macro language to Excel Visual Basic. This effort also provides critical client software support through Microsoft Office applications such as the electronic FYDP book.

**Classification:** Unclassified

**Sponsor:** OSD(PA&E)  
FICAD  
The Pentagon, Room 2D278  
Washington, DC 20301  
Donald Tison, (703) 697-4311

**Performer:** RAND

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	96	\$170,000	
	97	\$200,000	
	98	\$200,000	

**Schedule:**      Start              End  
                          Ongoing

**Data Base:**

**Publications:**    TBD

**Category:**        II.C

**Keywords:**        Government, Programming, Forces, Life Cycle, Acquisition Strategy, Mathematical Modeling, Computer Model

### PA&E-3

**Title:**              Visibility and Management of Operating and Support Costs (VAMOSC) for Major Weapon Systems

**Summary:**        Follow-on to CIM-funded Functional Process Improvement (FPI) project for VAMOSC. The FY 1997 data standardization/identification effort will be based on lessons learned from the FY 1996 VAMOSC Business Process Review (BPR) and will lay a foundation for the prototype development of the standard "To Be" VAMOSC system.

**Classification:**    Unclassified

**Sponsor:**        OSD(PA&E)  
                          FICAD  
                          The Pentagon, Room 2D278  
                          Washington, DC 20301  
                          Donald Tison, (703) 697-4311

**Performer:**        Andrulis

**Resources:**      FY              Dollars              Staff-years  
                          96              \$275,000  
                          97              \$150,000  
                          98              \$250,000

**Schedule:**        Start              End  
                          Ongoing

**Data Base:**

**Publications:**

**Category:**        II.A.2

**Keywords:**        Government, Estimating, Reviewing/Monitoring, Programming, Forces, Facilities, Overhead/Indirect

### PA&E-4

**Title:**              Visibility and Management of Operating and Support Costs (VAMOSC) for Major Weapon Systems

**Summary:**        The objective of this effort is to maintain PA&E's VAMOSC capability. The contractor will support the VAMOSC/CIM working group and the Senior Level Steering Group, both of which comprise representatives from the CAIG, A&T, DUSD(L), CALS, DFAS, and the Services. The effort involves data modeling of Service VAMOSC databases, implementation of software that can read Service and DFAS data, update to Microsoft Access VAMOSC database application, and analysis of VAMOSC data for weapon systems

**Classification:**    Unclassified

**Sponsor:** OSD(PA&E)  
FICAD  
The Pentagon, Room 2D278  
Washington, DC 20301  
Donald Tison, (703) 697-4311

**Performer:** Andrulis

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	96	\$93,000	
	97	\$260,000	
	98	\$220,000	

**Schedule:** Start End  
Ongoing

**Data Base:**

**Publications:**

**Category:** II.A.2

**Keywords:** Government, Estimating, Reviewing/Monitoring, Programming, Forces, Facilities, Overhead/Indirect

## PA&E-5

**Title:** Improved Software Cost Reporting Processes for Weapon Systems

**Summary:** There is an urgent need to improve the reporting of actual costs incurred in the development of software for major defense acquisition programs for advanced weapon systems. These actual costs are the primary basis for the preparation of cost estimates for future weapon systems. However, there is currently no well-defined universal data that can be used to record the important aspects of a software task. Further, there is a need for a software cost model specific to OD (PA&E) requirements, which utilizes data about a software effort to predict its cost or schedule. This task will: (1) evaluate the minimum set of cost data that should be collected; and (2) develop a simplified, streamlined reporting format for use by all DoD program offices. This task will serve as a basis for a follow-on task to calibrate or develop software cost models that utilize the collected data.

**Classification:** Unclassified

**Sponsor:** OSD(PA&E)  
The Pentagon, Rm. 2D300  
Washington, DC 20301  
Dr. Vance Gordon, (703) 697-2999

**Performer:** Dr. Thomas Frazier, (703) 845-2132  
Dr. John Bailey, (703) 845-2132

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98	\$200,000	1.25

**Schedule:** Start End  
Sep 97 Jan 99

**Data Base:**

**Publications:** TBA

**Category:** II.C

**Keywords:** Government, Estimating, Production, Software, Study

**PA&E-6**

**Title:** Selected Acquisition Report (SAR) Cost Variance Analysis

**Summary:** The project will provide insight into the magnitude and sources of major defense acquisition program (MDAP) cost growth. The project will quantify the amount of MDAP cost growth that is attributable to policy decisions as well as the amount attributable to errors on the part of the acquisition community as a whole. The principal investigators will transfer historical cost data, cost variance data, and explanatory notes contained in SARs to an electronic spreadsheet. In addition, to recording the SAR taxonomy of cost variances, the principal investigators will classify historical cost variances according to a new taxonomy, which will be provided by the project sponsor.

**Classification:** Unclassified

**Sponsor:** OSD(PA&E)  
PFED  
The Pentagon, Room 2D322  
Washington, DC 20301  
Jermone E. Pannullo, (703) 693-7828

**Performer:** RAND

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96	\$65,000	
97	\$65,000	
98	\$165,000	

**Schedule:** Start End  
Ongoing

**Data Base:**

**Publications:**

**Category:** II.C

**Keywords:** Industry, Government, Estimating, Weapon Systems, Review, Study

**PA&E-7**

**Title:** Demilitarization and Disposal Costs of Tactical Aircraft

**Summary:** The project will build analysis tools for estimating the costs of demilitarization and disposal for tactical aircraft. This task is a natural complement to two similar studies, one recently completed for large aircraft (bombers and transports) and another still in progress for tactical missiles.

**Classification:** Unclassified

**Sponsor:** OSD(PA&E) with the cooperation of the three Service Cost Agencies  
OAPPD  
The Pentagon, Room 2D278  
Washington, DC 20301  
Richard P. Burke, (703) 697-5056

**Performer:** TBD

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
FY 97		
FY 98		

**Schedule:** Start End

**Data Base:**

**Publications:**

**Category:** I.D

**Keywords:** Government, Analysis, Retirement and Demilitarization, Risk/Uncertainty, Data Collection, Data Base, Study

**PA&E-8**

**Title:** Developing Cost Estimating Relationships for the Streamlined Manufacturing Environment

**Summary:** The objective of this task is to examine specific acquisition reform measures that have been proposed and to develop methodologies for predicting quantitatively the effects on RDT&E and procurement costs of acquisition reform and manufacturing streamlining.

**Classification:** Unclassified (Proprietary Information)

**Sponsor:** OSD(PA&E)

OAPPD

The Pentagon, Room 2D-278

Washington, DC 20301

Richard P. Burke, (703) 697-5056

**Performer:** IDA

Dr. Karen W. Tyson, (703) 845-2572

Dr. J. R. Nelson, (703) 845-2571

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
		\$200,000	1.3

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Mar 96	Jun 98

**Data Base:** None

**Publications:** TBD

**Category:** I.B

**Keywords:** Industry, Estimating, Production, Acquisition Strategy, Automation, Advanced Technology, Case Study, Review

**PA&E-9**

**Title:** IDA Cost Research Symposium

**Summary:** IDA conducts a cost research symposium to facilitate the exchange of information on cost research that is in progress and planned, thereby avoiding wasteful duplication of effort and providing for more informed research planning decisions by participating offices. The Chairman, OSD CAIG, cosponsors this symposium. The 1998 Symposium will focus on the status of the DoD's capabilities to estimate the costs of future weapon systems and integration of this information into the DoD Six-Year Cost Research Plan. Documentation of the symposium includes a catalog of cost research projects recently completed or still in progress at participating offices.

**Classification:** Unclassified

**Sponsor:** IDA Central Research Program

OD(PA&E)

**Performer:** IDA

Dr. Stephen J. Balut, (703) 845-2527

**Resources:**     FY                    Dollars                    Staff-years  
    \$45,000                    0.3

**Schedule:**     Start                    End  
                          Oct 97                    Sep 98

**Data Base:**     **Title:**                    DoD Cost Research Projects

**Description:**        Summary descriptions of cost research projects (an example is this description)

**Automation:**        On the web in Acrobat Reader.

**Publications:**   *The 1998 IDA Cost Research Symposium*, Stephen J. Balut, Document D-2173, Unclassified, August 1998.

**Category:**        II.A.1

**Keywords:**        Government, Reviewing/Monitoring, Forces, Weapon Systems, Life Cycle, Data Collection, Data Base

## PA&E-10

**Title:**                    Cost Analysis of Advanced Materials

**Summary:**            Advanced materials are increasingly being used in new weapon systems. The limited cost history and difficulty in identifying the cost drivers and risks for new materials and processes complicate estimating the costs of systems incorporating these materials. This project will develop an advanced materials/processes primer to aid analysts in cost estimates. The materials examined will include ceramics, metal matrix composites, ceramic matrix composites, intermetallic materials, and superalloys. In addition, PA&E cost knowledge of organic matrix composites will be updated to reflect technologies developed since the studies in 1991.

**Classification:**    Unclassified

**Sponsor:**            OSD(PA&E)  
                          WSCAD  
                          The Pentagon, Room 2C310  
                          Washington, DC 20301  
                          Mr. Gary Bliss (703) 697-7282

**Performer:**         RAND

**Resources:**        FY                    Dollars                    Staff-years  
                          98                    \$200,000

**Schedule:**        Start                    End  
                          Oct 96                    Ongoing

**Data Base:**

**Publications:**

**Category:**         I.C.1

**Keywords:**         Government, Analysis, Weapon Systems, EMD, Production, Demonstration/Validation, Labor, Material, Schedule, Study



**PA&E-11**

**Title:** Cost of Developing and Producing Next Generation Tactical Aircraft

**Summary:** Over the next five years, DoD will be making funding decisions for tactical aircraft development and production, amounting to over \$350 billion. CAIG is responsible for preparing independent cost estimates for these aircraft for cost certification to Congress. The existing tools do not address the cost of the new generation fighter aircraft. Design attributes of the next generation of tactical aircraft are not accommodated in existing cost estimating tools. Important attributes include low observable, advanced materials (both composites and metals), integrated avionics, and unique propulsion designs. These attributes are all evident in the F-22 and Joint Strike Fighter (JSF) programs. An urgent need exists to develop the necessary cost estimating tools to support these and future tactical aircraft programs. The objective is to collect, analyze, and exploit the latest available information to develop databases and methods for estimating the development and production costs of the next generation tactical aircraft.

**Classification:** Unclassified

**Sponsor:** OSD(PA&E)  
WSCAD  
The Pentagon, Room 2C-310  
Washington, DC 20301  
Gary Pennett, (703) 697-7282

**Performer:** IDA  
Mr. Bruce Harmon, (703) 845-2501

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$250,000	
98	\$200,000	

**Schedule:**

<u>Start</u>	<u>End</u>
Oct 96	Sep 98

**Data Base:**

**Title:**

**Description:** Cost and other data on contemporary aircraft programs, including F-117, B-2, YF/F-22, YF-23, F/A-18E/F, V-22, C-17

**Automation:** TBD

**Publications:**

**Categories:** I.C.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Aircraft, EMD, Material, Demonstration/Validation, Engineering

**PA&E-12**

**Title:** Contractor Cost Data Reporting (CCDR) Clearinghouse/Repository

**Summary:** The DoD develops cost estimates of major weapon systems using historical data, the primary sources of which are the Contractor Cost Data Reports (CCDRs) provided by hundreds of defense contractors. CCDR data requirements have not been revised substantially since the system was established nearly two decades ago. In annual meetings at IDA on cost research, the directors of the major DoD organizations that do defense cost research noted that the CCDR system had not been meeting their needs. Since then, steps have been taken to improve the usefulness of the CCDR system, to include analysis and

reengineering of the system. This effort addresses additional steps that will further improve the utility of the CCDR system. This includes preparation of the CCDR Handbook that is consistent with established CCDR policies, DoD cost estimating requirements, and contractor capabilities. The study will also evaluate the existing CCDR report formats and make appropriate recommendations to re-design or replace the forms. In this regard, IDA will review and evaluate the availability of DCAA provided data to satisfy overhead cost estimating needs. This task will also address the potential for developing and implementing a system to collect data directly from the contractor's accounting system and convert or map the data into the standard CCDR report formats.

**Classification:** Unclassified

**Sponsor:** OD(PA&E), WSCAD  
The Pentagon, Rm. 2C310  
Washington, DC 20301  
Thomas J. Coonce, (703) 695-7282

**Performer:** To Be Determined

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$150,000	
	98	\$220,000	
	99	\$75,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 96	Sep 99

**Data Base:**

**Publications:**

**Category:** II.A.2

**Keywords:** Government, Industry, Analysis, Labor, Material, Schedule, Study

## PA&E-13

**Title:** CAIG Information Center Support

**Summary:** The purpose of this task is to purchase equipment and software for establishing the CAIG Information Center. The immediate objective is to establish a central catalog of existing holdings, including technical reports, CAIG case files, and PPBS documents.

**Classification:** Unclassified

**Sponsor:** OSD(PA&E)  
Resource Analysis  
The Pentagon, Room 2D278  
Washington, DC 20301  
Libbie Blaeuer, (703) 697-0221

**Performer:**

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$50,000	
	98	\$50,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 96	Sep 98

**Database:**

**Publications:**

**Category:** II.A

**Keywords:** Government, Industry, Data Collection, Data Base

## PA&E-14

**Title:** Improved Methodology for Projection of Development Costs

**Summary:** The purposes of this task are to develop a better understanding of the factors that drive development costs for DoD systems, and to devise an improved methodology for projecting those costs.

**Classification:** Unclassified

**Sponsor:** OSD(PA&E)  
Resource Analysis  
The Pentagon, Room 2D278  
Washington, DC 20301  
Steve Miller, (703) 697-0317

**Performer:** LMI

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98	\$200,000	
	99	\$50,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 96	Sep 98

**Database:**

**Publications:**

**Category:** I.C

**Keywords:** Government, Industry, Weapon Systems, Demonstration/Validation, EMD, Risk/Uncertainty, Data Collection, Data Base, Expert System.

**BALLISTIC MISSILE DEFENSE ORGANIZATION**

<b>Name</b>	Ballistic Missile Defense Organization		
<b>Address</b>	Crystal Square Two, Suite 809 1725 Jefferson Davis Highway Arlington, VA 22202		
<b>Director</b>	Donna M. Snead, (703) 604-3584		
<b>Size</b>	Professional:		7
	Support:		—
	Consultants:		36
	Subcontractors:		—
<b>Focus</b>	BMDO Cost Policy, Cost Estimating, Cost Analysis, Cost Research/Methodology Improvement		
<b>Activity</b>	Number of projects in progress:	6	Cost Research/Method Improvement
	Average duration of project:		4 months
	Average number of staff members assigned to a project:		2
	Average number of staff-years expended per project:		1+
	Percentage of effort conducted by consultants:		85%

## BMDO-1

**Title:** Automated CER Data Base

**Summary:** This effort will establish a relational data base of cost estimating relationships (CERs) which are available for use in BMDO Independent Cost Assessments. At this time we envision that the data base will consist of four tables which contain (1) CERs and their fit statistics; (2) variables and their properties (units, ranges, etc.); (3) the CERs' coefficients and their statistics; and (4) a description of the source documentation.

**Classification:** Unclassified

**Sponsor:** Ballistic Missile Defense Organization (BMDO)  
BMDO/POE  
Crystal Square Two, Suite 1200  
1725 Jefferson Davis Highway  
Arlington, VA 22202  
Donna M. Snead, (703) 604-3584

**Performer:** MCR, Inc.  
1111 Jefferson Davis Highway, Suite 601  
Arlington, VA 22202  
Vernon Reisenleiter, Tom Gilbride, (703) 416-9500

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98		1.2

**Schedule:**

<u>Start</u>	<u>End</u>
Jan 98	Sep 98

**Data Base:**

<b>Title:</b>	
<b>Description:</b>	The structure of the data base was described under summary
<b>Automation:</b>	Microsoft Access

**Publications:** TBD

**Category:** II.A.2

**Keywords:** Weapon Systems, Estimating, Data Base

## BMDO-2

**Title:** BMDO Operating & Support Cost Estimating

**Summary:** Use of Operating & Support (O&S) cost estimates in the acquisition review and decision process is becoming more prevalent. The desire to maximize the return on budgeted acquisition dollars, reduced operating and maintenance budgets, and the need to trade off capabilities to reduce costs, mean more information on the cost to field a system is necessary. Also, with multiple programs in the early to mid-development stages, when O&S trades are of most benefit, the BMDO has found that O&S considerations are of growing importance to their systems decision analysis processes. Concurrently, it was noted that there is no common system of systems approach to O&S costing across these programs. Definition of the O&S period, ground rules for application of O&S costs, system life span, and rules for apportionment of O&S across multiple systems are among the issues which need to be addressed for future BMDO O&S estimates.

**Classification:** Unclassified

<b>Sponsor:</b>	Ballistic Missile Defense Organization (BMDO) BMDO/POE Crystal Square Two, Suite 1200 1725 Jefferson Davis Highway Arlington VA 22202 Donna M. Snead, (703) 604-3584		
<b>Performer:</b>	MCR, Inc. 1111 Jefferson Davis Highway, Suite 601 Arlington VA 22202 Joe Wagner, (703) 416-9500		
<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98		0.1
<b>Schedule:</b>	<u>Start</u>	<u>End</u>	
	Feb 98	Sep 98	
<b>Data Base:</b>	N/A		
<b>Publications:</b>	BMDO Operating & Support Cost Estimating Guide, pending		
<b>Category:</b>	II.A.2		
<b>Keywords:</b>	Government, Industry, Estimating, Operations and Support, Life Cycle, Weapon Systems		

**BMDO-3**

**Title:** BMDO Cost Risk Research

**Summary:** The Ballistic Missile Defense Organization requires accurate risk estimation for budget preparation. A variety of risk research topics will be studied for continued enhancement of the BMDO cost risk model (last updated October 1997). The BMDO Cost Risk Working Group will meet about quarterly to review and discuss the progress and results of the research. Topics include: Study of EVM Data to provide insights into time distribution of cost growth; Procedures for promulgation of risk results to Program Offices; Risk in O&S; Cost Risk for the NMD System of Systems; Modeling mid-phase risk assessments; Assessment of Schedule/Technical Risk Criteria and Weighting Schemes; Study of Cost Estimating Risk; Study of Hardware-to-Below-the-Line cost growth correlation; Study of COTS/NDI effect on Cost Growth; Effect of the "Ping Factor" on Cost Estimates; Revisit of the effect of Cost Analyst Confidence Scores; Coefficient of Variation as a QA Metric; Software Cost Growth; Re-visit of Schedule/Technical Mapping Equations.

**Classification:** Unclassified

**Sponsor:** Ballistic Missile Defense Organization (BMDO)  
BMDO/POE  
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**Performer:** MCR, Inc.  
1111 Jefferson Davis Highway, Suite 601  
Arlington VA 22202  
Vernon Reisenleiter, (703) 416-9500

**Dick Coleman, (703) 834-5000; Jessica Ayers, (703) 416-9500**

<b>Resources:</b>	<u>FY</u> 98	<u>Dollars</u>	<u>Staff-years</u> 1.3
<b>Schedule:</b>	<u>Start</u> Apr 98	<u>End</u> Dec 98	
<b>Data Base:</b>	<u>Title:</u>  <u>Description:</u> Databases will consist of historical SARs and CPRs <u>Automation:</u> Microsoft Excel and Crystal Ball		
<b>Publications:</b>	<i>Cost Risk Analysis of the Ballistic Missile Defense (BMD) System, Revision 3</i> , completed October 1997		
<b>Category:</b>	II.A.2		
<b>Keywords:</b>	Government, Estimating, Weapon Systems, Life Cycle, Risk/Uncertainty, Mathematical Modeling, Computer Model		

**Title:** Cost Drivers Analysis

**Summary:** BMDO is establishing a technology road map and prioritizing its technology development programs. This research effort supports that objective. It is being done in conjunction with a working group whose membership is responsible for technology development, acquisition, and cost estimating. The purpose of this effort is to provide insights into: the hardware items, the software products, and the support activities; and the technical and performance CER variables that drive the life cycle costs of BMDO's Major Defense Acquisition Programs (MDAPs). A long term product of this effort will be the accumulation of databases, cost estimating relationships, and modeling approaches for estimating the life cycle cost impacts of advanced technology applications to missile defense systems. In the first phase of Cost Drivers Analysis, BMDO/POE examined its Independent Cost Assessments to identify the high cost items at the fourth and lower levels of the cost breakdown structures and to identify cost driving items common across the MDAPs. BMDO/POE also examined the sensitivity of MDAP cost estimates to variation in the independent variables of the BMDO ICA CERs. At the CER level the analysis revealed a number of cost driving technical and performance characteristics, such as fabrication yield and integrated chip count as drivers of focal plane array (FPA) production costs. At the MDAP level the analysis determined the first order impacts of the same technical and performance subsystem life cycle costs - such as FPA yield on the life cycle cost of the THAAD IR seeker. Continuing Cost Drivers Analysis research is focusing on refining the earlier results and conducting detailed cost impact assessments of technology insertions into BMDO MDAPs. This project includes service participation.

**Sponsor:** Ballistic Missile Defense Organization (BMDO)  
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Arlington, VA 22202

III-13



<b>Performer:</b>	MCR, Inc. 1111 Jefferson Davis Highway, Suite 601 Arlington VA 22202 Vernon Reisenleiter, (703) 416-9500		
<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98		1 (FTE)
<b>Schedule:</b>	<u>Start</u>	<u>End</u>	
	Aug 97	Indef	
<b>Data Base:</b>	<u>Title:</u>  <u>Description:</u> Data base will consist of lists of cost drivers, critical parameters, and candidate cost improvement projects.  <u>Automation:</u> Manual at this time		
<b>Publications:</b>	TBD		
<b>Category:</b>	II.A.2		
<b>Keywords:</b>	Weapon Systems, Life Cycle		

**BMD0-5**

**Title:** Fixed Site Early Warning Radars

**Summary:** This type of radar has some unique programmatic features. These include turn-key contracts, mixing development and production activities (and funding) on the same contract, production in a factory environment with final integration and assembly at a remote site. A previous study (1984) to update CERs for ABM Radars did not appear to include systems with these programmatic characteristics. A more recent cost estimate (1988) for the BMEWs Site III upgrade did. However, the data base was small and also included data on mobile long-range surveillance Radars. A recent small scale study produced a factor for I&A and several BTL CERs. Jane's indicates that a number of BMEWs and PAVE-PAWS sites were upgraded in the late 1980s. The purpose of this research is to collect cost, technical, and programmatic data on these upgrades including support concepts and O&S experience. The purpose of this research is to improve BMDO estimates for GBR, XBR, and UEWR.

**Classification:** Unclassified (proprietary), Classified supplement possible

**Sponsor:** Ballistic Missile Defense Organization (BMDO)  
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Crystal Square Two, Suite 1200  
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Donna M. Snead, (703) 604-3584

**Performer:** MCR, Inc.  
1111 Jefferson Davis Highway, Suite 601  
Arlington, VA 22202  
Vernon Reisenleiter, (703) 416-9500

**Resources:** FY Dollars Staff-years  
98 0.5

**Schedule:** Start End  
Mar 98 Dec 98

**Data Base:** *Title:*  
*Description:* Database will consist of cost, programmatic and technical information  
*Automation:* Microsoft Excel  
**Publications:** Technical Report  
**Category:** II.A.2  
**Keywords:** Estimating, Government, Industry

## BMDO-6

**Title:** Development CERs  
**Summary:** Certain important CERs for the development phases require improvement. A set of CERs used by BMDO to estimate development engineering has a high standard error. Further it is desirable to use time as a predictor variable for both development engineering and development phase SEPM. In this project we will review some recent work for suitability to BMDO's needs. We will also expand existing data sets and develop new CERs.  
**Classification:** Unclassified (Proprietary)  
**Sponsor:** Ballistic Missile Defense Organization (BMDO)  
 BMDO/POE  
 Crystal Square Two, Suite 1200  
 1725 Jefferson Davis Highway  
 Arlington, VA 22202  
 Donna M. Snead, (703) 604-3584  
**Performer:** MCR, Inc.  
 1111 Jefferson Davis Highway, Suite 601  
 Arlington, VA 22202  
 Vernon Reisenleiter, (703) 416-9500  
**Resources:** FY      Dollars      Staff-years  
 98      TBD  
**Schedule:** Start      End  
 Jul 98      TBD  
**Data Base:** *Title:*  
*Description:* Data base will consist of development phase cost data, system technical data, and related programmatic information  
*Automation:* Microsoft Excel  
**Publications:** Technical Report  
**Category:** II.A.2  
**Keywords:** Engineering, CER, Weapon Systems

## BMDO-7

**Title:** EMD Learning Slope and the Prototype to Production Step-Down Factor  
**Summary:** An analysis of missile data conducted for NCCA in 199x simultaneously determined production and development phase learning curve slopes and a prototype to production step-down factor. The analysis was updated for NAVAIR 199y. The purpose of this study is to conduct similar analysis for Radar systems.

**Classification:** Unclassified

**Sponsor:** Ballistic Missile Defense Organization (BMDO)  
 BMDO/POE  
 Crystal Square Two, Suite 1200  
 1725 Jefferson Davis Highway  
 Arlington, VA 22202  
 Donna M. Snead, (703) 604-3584

**Performer:** MCR, Inc.  
 1111 Jefferson Davis Highway, Suite 601  
 Arlington, VA 22202  
 Vernon Reisenleiter, (703) 416-9500

**Resources:** FY            Dollars            Staff-years  
 99            TBD

**Schedule:** Start            End  
 TBD            TBD

**Data Base:** Title:  
Description:    Development and production cost data and quantities for electronics systems  
Automation:    Microsoft Excel

**Publications:** TBD

**Category:** II.A.2

**Keywords:** Estimating, Electronics/Avionics, EMD, Cost Progress Curve

**ARMY COST AND ECONOMIC ANALYSIS CENTER**

<b>Name</b>	US Army Cost and Economic Analysis Center	
<b>Address</b>	5611 Columbia Pike Falls Church, VA 22041-5050	
<b>Director</b>	Robert W. Young; (703) 681-3217; DSN: 761-3217; FAX: (703) 681-8732	
<b>Size</b>	Professional:	56
	Support:	10
	Consultants:	0
	Subcontractors:	1
<b>Focus</b>	<p>The focus of the Army's Centrally Funded Cost Research Program is to improve the capability of the Army to develop cost estimates and economic analysis. The main categories of concentration are:</p> <ul style="list-style-type: none"> <li>Data Base Development</li> <li>Methodology Development</li> <li>Costing the Effects of New Technology</li> <li>Software Support Systems</li> <li>PPBES Linkages</li> </ul> <p>The Commodity areas we cover are:</p> <ul style="list-style-type: none"> <li>Aircraft Systems</li> <li>Missiles and Space Systems</li> <li>Wheel and Tracked Combat Vehicle Systems</li> <li>Communications and Electronics Systems</li> <li>General Systems/Future Technology/Tools and Models</li> <li>Information Management Systems</li> <li>Force Unit Costing</li> <li>Operating and Support Costing</li> <li>Financial Management and Operations</li> </ul>	
<b>Activity</b>	Number of projects in process:	15-20
	Average duration of a project:	9-12 months
	Average number of staff members assigned to a project:	0.25
	Average number of staff-years expended per project:	2
	Percentage of effort conducted by consultants:	0%
	Percentage of effort conducted by contractors:	90%
	Percentage of effort conducted by subcontractors:	5%

**CEAC-1**

**Title:** Update FORCES Cost Model, EFCDB, Cost Factor Handbook

**Summary:** Update the costs and factors in FORCES. Develop a deployment module that provides user with one source of input and output to estimate the cost to deploy army units in support of any type contingency to include documentation. The Forces and Organization Cost Estimating Systems (Forces) includes a Force Cost Model, Exportable Force Cost Database (EFCDB), Cost Factors Handbook, Military End Strength Reduction Model, and Civilian Manpower Reduction Model. The Cost Factor Handbook will be linked to ACEIT to improve cost analysts access to the data.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center

**Performer:** Management Analysis, Inc. (MAI)  
Tully Anderson

**Resources:** FY            Dollars            Staff-years  
97                \$380,000

**Schedule:** TBD

**Data Base:** The Exportable Force Cost Data Base

**Publications:**

**Category:** II.A.1

**Keywords:** Government, Estimating, Analysis, Forces

**CEAC-2**

**Title:** Crosswalk ISR Cost Factors into FORCES Cost Model

**Summary:** Expand and improve the cost estimating capabilities of FORCES by incorporating the Installation Status Report (ISR) new construction and sustainment factors into it. USACEAC has validated new construction and sustainment cost factors for the ISR that have proven to be very accurate in predicting cost requirements for the Army. This project will take full advantage of the financial data linkages which have been completed through AMSCO redesign efforts and linkage to DFAS 218 report by developing and incorporating cost factors into a format usable in FORCES.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center

**Performer:** Management Analysis, Inc. (MAI)  
Tully Anderson

**Resources:** FY            Dollars            Staff-years  
97                \$125,000

**Schedule:** TBD

**Data Base:** The Exportable Force Cost Data Base

**Publications:**

**Category:** II.A.1

**Keywords:** Government, Estimating, Analysis, Forces

### CEAC-3

**Title:** FORCES Deployment Cost Model

**Summary:** Update the cost factors used in the Army Deployment Cost Model. The current FORCES model provides cost information on the activation, annual operations, inactivation and movement of Army TO&E force units and requires considerable adjustments to be made by cost analysts when estimating deployment of forces in support of a contingency operation. The Army Deployment Cost Model will be a stand alone self contained model which will allow Army Budget, PA&E and other cost analysts to derive accurate planning costs for the development of army units into a Theater of Operations.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center

**Performer:** Management Analysis, Inc. (MAI)  
Tully Anderson

**Resources:** FY            Dollars            Staff-years  
97                \$215,000

**Schedule:** TBD

**Data Base:** The Exportable Force Cost Data Base

**Publications:**

**Category:** II.A.1

**Keywords:** Government, Estimating, Analysis, Forces

### CEAC-4

**Title:** Installation Status Report (ISR) Part 1, (Infrastructure) Revision and Update

**Summary:** ISR maintains the current condition assessment that incorporates and validates installation infrastructure standards. ISR I cost factors are developed by Facility Category Group (FCG) for Sustainment, New Construction, and Renovation. The revised, current cost factors in ISR are for CONUS/OCONUS installations. The update includes factors and refined methodologies for CONUS/OCONUS, Reserve, National Guard Bureau, and Medical facilities, and the sustainment and renovation factors of all historical facilities.

**Classification:** Unclassified

**Sponsor:** U S Army Cost and Economic Analysis Center

**Performer:** Management Analysis, Inc. (MAI)

**Resources:** FY            Dollars            Staff-years  
97                \$100,000

**Schedule:** Start            End  
Sep 97            Mar 98

**Data Base:**

**Publications:**

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Infrastructure, Operations and Support

## CEAC-5

**Title:** The Army Manpower Cost System (AMCOS)

**Summary:** The Army Manpower Cost System (AMCOS) is a family of active, reserve, and civilian manpower models developed to improve the accuracy and flexibility of manpower cost estimation. USACEAC has responsibility for operating, maintaining, updating and modifying the AMCOS model, which is used to provide manpower cost estimates. This effort will develop a Windows based database for AMCOS with a new user interface and consolidate six AMCOS databases into a single database.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center

**Performer:** SRA

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$141,000	

**Schedule:** TBD

**Data Base:**

**Publications:**

**Category:** II.A.2

**Keywords:** Government, Estimating, Analysis, Forces, Data Collection, Manpower/Personnel

## CEAC-6

**Title:** ACET/ACDB

**Summary:** This project funds the Army portion of a joint effort of the US Army Cost and Economic Analysis Center and the Air Force Electronic Systems Center and Air Force Cost Analysis Agency to meet the Army Cost Estimation Support Requirements. This funds dial up support for technical assistance when required for Army Cost Analysts and support contractors. It includes the update of annual Inflation Indices, problem resolution, bug fixes and configuration control for Army Acquisition Information/Databases. This contract acts as the Super Database Administrator (DBA) for USACEAC commodity contractors' DBAs.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center  
Richard Bishop, (703) 681-9124; DSN: 761-9124

**Performer:** Tecolote Research, Inc.  
Tom Kielpinski

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98	\$150,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Apr 98	May 99



**Data Base:** IBM PC Compatible  
**Publications:** Tecolote ACE-IT Users Guide  
**Categories:** II.A.1, II.A.2  
**Keywords:** Government, Weapon Systems, Data Base

## CEAC-7

**Title:** Communications and Electronics Cost Data Base/Methodology  
**Summary:** This project will develop a Communications and Electronics Database. This effort will add additional Army communications-electronics systems to the database; expand the electronics Work Breakdown Structure to include active RF assemblies, analog electronics and power supplies; update existing CERs. Including Investigation of future alternatives for wireless network connectivity; develop useful factors and investigate potential models supporting this new capability.  
**Classification:** Unclassified  
**Sponsor:** US Army Cost and Economic Analysis Center  
**Performer:** Technomics, Inc.  
 John Horak  
**Resources:** FY            Dollars            Staff-years  
 97                \$125,000  
**Schedule:** Start            End  
 Sep 97           Sep 98  
**Data Base:** ACDB  
**Publications:** *Communications And Electronics Cost Model*, TR-9607-01, October 1996  
**Categories:** I.C.2, II.A.2, II.B, II.C  
**Keywords:** Government, Estimating, Analysis, WBS, Data Base, CER, Data Collection

## CEAC-8

**Title:** Operating and Support Management Information System (OSMIS) Data Base Management  
**Summary:** OSMIS is a Management Information System designed to assist the Army in determining the historical operating and support costs of selected major fielded weapons systems through the production of cost data and cost factors based on actual usage data. The cost data generated from OSMIS is derived from existing Army Logistics Support Management Information Systems. Develop annual data collection process; collect data from LIF, PMR, ULLS and other sources. Construct annual Materiel Systems Definition by system/Line Item Number. Generate and validate Weapon system to ammunition crosswalk tables, Unit tables and system asset tables, Cost Tables and OSMIS Cost Tables. Perform system maintenance and develop system documentation.  
**Classification:** Unclassified  
**Sponsor:** US Army Cost and Economic Analysis Center  
 Terry Mateer, (703) 681-3335; DSN: 761-3335

**Performer:** CALIBRE Systems, Inc.  
Bernard Bean

**Resources:** FY            Dollars            Staff-years  
97            \$799,000

**Schedule:** Start            End  
Nov 97            Nov 98

**Data Base:** OSMIS

**Publications:** U.S Army Operating and Support Management Information System (OSMIS) Manuals (FY97); Reference Table Maintenance Manual; Program Maintenance Manual; OSMIS Operations Manual.

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Budgeting, Weapon Systems, Operations and Support, Data Base

#### CEAC-9

**Title:** Operating and Support Management Information System (OSMIS) Output Products

**Summary:** OSMIS is a Management Information System designed to assist the Army in determining the historical operating and support costs of selected major fielded weapons systems through the production of cost data and cost factors based on actual usage data. The cost data generated from OSMIS is derived from existing Army Logistics Support Management Information Systems. This contract develops O&S Cost Factors for the POM, BES and President's Budget, Aircraft reimbursement rates, Class II & IV Cost Factors and an Annual Report in various formats. The OSMIS processed data is used in other systems and models such as FORCES, REVOLVER, and the OSD VAMOSC System Interface Model. OSMIS also contains information on consumables, depot level reparables (DLRs), training ammunition, OPTEMPO, densities, depot maintenance, and petroleum, oil and lubricants (POL).

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center  
Terry Mateer, (703) 681-3335; DSN: 761-3335

**Performer:** CALIBRE Systems, Inc.  
Bernard Bean

**Resources:** FY            Dollars            Staff-years  
97            \$390,000

**Schedule:** Start            End  
Nov 97            Nov 98

**Data Base:** OSMIS

**Publications:** "U.S Army Operating and Support Management Information System (OSMIS)/ Visibility and Maintenance of Operating and Support Cost (VAMOSC) Annual Report (FY97)," 27 Oct 1997.

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Budgeting, Weapon Systems, Operations and Support, Data Base

## CEAC-10

**Title:** Operating and Support Management Information System (OSMIS) Special Studies

**Summary:** OSMIS is a Management Information System designed to assist the Army in determining the historical operating and support costs of selected major fielded weapons systems through the production of cost data and cost factors based on actual usage data. The cost data generated from OSMIS is derived from existing Army Logistics Support Management Information Systems. This effort will develop a relational database to increase the users access to the database and to decrease the query turn-around time dramatically. Other special studies include: Increase OSMIS database coverage for Contractor Logistics Support; Integrated Sustainment Maintenance; IMPAC purchases; and warranty demands. Create OCIE market basket to support PPBES, Investigate sources for PDSS information. Coordinate Master System Definitions with system PMOs for validation and verification. Investigate ULLS-G for additional useful data, Incorporate Army Modernization Reference Data into OSMIS database. Develop procedure for tracking Training Resource Model projections with historical OSMIS data. Investigate LIF/CDBB as sources of data and recommend necessary fixes/changes to improve databases. Support Prime Vendor Support (PVS) projects such as AH-64A, M109A6 etc. Develop methodology to account for age of the fleet tactical, combat vehicles and aircraft.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center  
Terry Mateer, (703) 681-3335; DSN: 761-3335

**Performer:** CALIBRE Systems, Inc.  
Bernard Bean

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$844,000	

**Schedule:**

<u>Start</u>	<u>End</u>
Dec 97	Dec 98

**Data Base:** OSMIS

**Publications:** TBD

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Budgeting, Weapon Systems, Operations and Support, Data Base

## CEAC-11

**Title:** Aircraft Module Data Base Migration and Methodology Enhancement

**Summary:** This project will provide products to improve the capability of the Aircraft Cost Analyst to develop accurate cost estimates as high technology products and processes increase in Aircraft systems. This project includes the completion of the Aircraft Module conversion

activities and the fielding of the Aircraft Module in the Automated Cost Database (ACDB) to USACEAC, PEO-AVIATION and AMCOM.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center

**Performer:** Science Applications International Corporation (SAIC)  
Paul Popovich

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$125,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Apr 97	Jun 98

**Data Base:** Automated Cost Data Base (ACDB)

**Publications:**

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Aircraft, Electronics/Avionics, Data Base, Data Collection

## CEAC-12

**Title:** Missile Module of ACDB

**Summary:** USACEAC has developed a standard architecture for the acquisition of Weapon and Information Management systems. The primary objective of this project is to identify and collect missile cost data from CCDRs, CPRs, contracts or other sources which can be mapped and normalized to populate the Missile Module of the USACEAC data base. Data from other DOD agencies are of particular interest if applicable to US Army Missile Systems. The database will be used to develop improved CERs, learning curves and cost factors. Results will be provided in USACEAC Space and Missile CER cost estimating library and distributed in ACEIT. The Missile module of ACDB will be fielded to USACEAC, PEO-TACTICAL MISSILES, SMDC and AMCOM.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center

**Performer:** Tecolote Research, Inc.

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$125,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Apr 98	Apr 99

**Data Base:** Automated Cost Data Base (ACDB)

**Publications:**

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Missiles, Space Systems, Data Base, CER, CPR/CCDR, Data Collection

**CEAC-13**

**Title:** Wheel and Tracked Combat Vehicle Data Base and Methodology Development

**Summary:** This project will provide USACEAC support in the development of a Wheeled and Tracked Vehicle Module (WTVM) for the Automated Cost Database (ACDB), a component of the Army Cost Estimating Integrated Tool (ACEIT). Support will consist of data collection and analysis, data base evaluation and management, and the development of cost relationships using collected data. It also includes fielding the database to USACEAC, PEO-GROUND COMBAT & SUPPORT SYSTEMS, and TACOM. Performing special studies and analyses that further the state of the art of cost estimation of Wheeled and Tracked Vehicle Systems.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center

**Performer:** Science Applications International Corporation (SAIC) Len Ogborn

**Resources:** FY            Dollars            Staff-years  
                   98            \$125,000

**Schedule:** Start            End

**Data Base:** Automated Cost Data Base (ACDB)

**Publications:**

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Land Vehicles, CER, CPR/CCDR, Data Collection, Data Base

**CEAC-14**

**Title:** Performance Affordability Assessment Model (PAAM)

**Summary:** Develop a cost model that captures, "Cost As an Independent Variable". Using the battlefield effectiveness model, Combined Arms Support Task Force Evaluation Model (CASTFOREM), provide linkage between the performance characteristics of systems or technologies that are played within the CASTFOREM model and their costs.

**Classification:** Unclassified

**Sponsor:** US Army Tank, Automotive and Armaments Command, US Army Cost and Economic Analysis Center  
                   Diane Hohn, (810) 574-8693; DSN: 786-8693

**Performer:** Science Applications International Corporation (SAIC)

**Resources:** FY            Dollars            Staff-years  
                   97            \$55,000 (in kind)

**Schedule:** TBD

**Data Base:**

**Publications:**

**Categories:** I.B.1, II.C

**Keywords:** Estimating, Analysis, CER, Data Base, Data Collection, Electronics/Avionics

**CEAC-15**

**Title:** Standard Service Costing (SSC)

**Summary:** This project will develop the methodology and databases for estimating the standard cost of services provided by Army Installations. This project will include an umbrella concept to implement SSC using Proof of Principle Plan, a mechanism to improve or develop SSC costing methodologies, and a case study for measuring performance and estimating costs of services. The methodologies developed will support ACSIM's Installation Status Report (ISR) Part III and AIM-HI Requirements Generator in connecting expected cost to output and outcome measures IAW GPRA.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center

**Performer:** Calibre Systems Inc.

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$125,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Aug 97	Aug 98

**Data Base:**

**Publications:**

**Category:** II.A.1

**Keywords:** Government, Estimating, Analysis, Infrastructure, Facilities, Data Collection, Case Study

**CEAC-16**

**Title:** Leadership Training Materials for Activity Based Cost (ABC)

**Summary:** This project will develop the Army-wide ABC training capability needed, establish an Internet web home page and associated links to help train and administer the Army managerial costing policy. The project will develop a course and manual for installation and garrison commanders and project/service managers that imparts the concepts and knowledge of Managerial/Cost Accounting, ABC, Service Based Costing (SBC), and Standard Service Costing (SSC). Develop a Compact Disk (CD) Computer Based Training (CBT) course for managerial Costing. Develop an Internet CD CBT that can be run over the Internet. Both products should be designed to provide enhanced distance learning capability using audio and video features and be interactive with students.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center

**Performer:** Calibre Systems Inc.

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$89,500	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Sep 97	Sep 98

**Data Base:**

**Publications:**

**Category:** II.A.1

**Keywords:** Government, Estimating, Analysis, Infrastructure, Facilities, Data Collection, Case Study

#### CEAC-17

**Title:** Standard Service Costing (SSC) FY98 Cost Factors

**Summary:** This project will develop expected cost factors based on approved SSC methodologies to support Army BASOPS requirement generation process at the MACXOM and Department of Army levels. Should cost factors will be based on qualitative and cost data collected during the ISR part III Beta test and the SBC data collected for FY's 95, 96 and 97.

**Classification:** Unclassified

**Sponsor:** U S Army Cost and Economic Analysis Policy

**Performer:** Calibre Systems Inc.

**Resources:** FY            Dollars            Staff-years  
97            \$125,000

**Schedule:** Start            End  
Sep 97            Sep 98

**Data Base:** **Title:**  
**Description:**  
**Automation:**

**Publications:**

**Category:** II.A.2

**Keywords:** Government, Estimating, Analysis, Infrastructure, Facilities, Study

#### CEAC-18

**Title:** ACEIT Economic Analysis Applications

**Summary:** This project funds the development of an Economic Analysis Tool using ACEIT and the ACE Executive to facilitate new user's ability to quickly develop an economic analysis and enhance the implementation of CAIV functions in ACEIT.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center  
Richard Bishop, (703) 681-9124; DSN: 761-9124

**Performer:** Tecolote Research, Inc.  
Tom Kielpinski

**Resources:** FY            Dollars            Staff-years  
97            \$90,000

**Schedule:** Start            End  
Apr 97            May 98

**Data Base:** IBM PC Compatible

**Publications:** Tecolote ACE-IT Users Guide

**Categories:** II.A.1, II.A.2  
**Keywords:** Government, Weapon Systems, Data Base

## CEAC-19

**Title:** ACEIT WIN Enhancements

**Summary:** This project funds the ACEIT WIN Enhancements and includes \$30K Air Force Cost Analysis Agency funding for ACE format, printing and documentation improvements. This includes improved flexibility for formatting and viewing reports, greater user control of column widths and row heights in tabular views and reports. New report formats will be provided such as a Variable Map, Calculation Trace-back and the inflation factors report. WIN ACE Enhancements, including improved support for team estimates, including support for multi-sheet workbooks; investigate feasibility for supporting "off-sheet" data references in ACE equations. Provide variable choice lists for appropriate columns, e.g., to show a list of variable names previously used for buy quantities, slope, fee, CERs, etc. This would enable a user to quickly find and re-use or not re-use previously used variables. Provide improved support for session and methodology navigation. For example, provide a capability to let the user highlight a variable used in an equation and bring up session information about that variable; allow for moving easily forward and backward through the logic chains in the estimate.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center  
Richard Bishop, (703) 681-9124; DSN: 761-9124

**Performer:** Tecolote Research, Inc.  
Tom Kielpinski

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$230,000	

**Schedule:**

<u>Start</u>	<u>End</u>
Apr 97	May 98

**Data Base:** IBM PC Compatible

**Publications:** ACE-IT Users Guide

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Weapon Systems, Data Base

## CEAC-20

**Title:** ACDB Enhancements

**Summary:** This project funds the update of the Database Administrator (DBA) and Database Entry (DBE) modules of the Automated Cost Database (ACDB) to be consistent with the ongoing ACDB Search and Retrieval (S&R) effort. The new S&R module will provide a modern, wizard-style, dialog driven interface to the existing databases. This will significantly improve the usability of the databases by cost analysts and estimators. This will provide resource data "autoloaders" similar to the existing technical data autoloader functions. This will also develop, implement, test and field a feature that provides the



DBE the ability to assign a single WBS cost line to multiple Cost Element Structures (CES), specifically allow non-recurring and recurring costs to be mapped to different CESs. This effort should develop standard CES mapping rules that would apply to many data bases (Standard Business Rules).

And also develop, implement, test, and field a feature that allows the use of Rich Text Format (RTF) in technical parameter and description fields. This will allow inclusion of conventional mathematical, engineering and scientific symbols without substitution of surrogate symbols.

**Classification:** Unclassified  
**Sponsor:** US Army Cost and Economic Analysis Center  
Richard Bishop, (703) 681-9124; DSN: 761-9124  
**Performer:** Tecolote Research, Inc.  
Tom Kielpinski  
**Resources:** FY            Dollars            Staff-years  
97            \$300,000  
**Schedule:** Start            End  
Apr 97            May 98  
**Data Base:** IBM PC Compatible  
**Publications:** Tecolote ACE-IT Users Guide  
**Categories:** II.A.1, II.A.2  
**Keywords:** Government, Weapon Systems, Data Base

## CEAC-21

**Title:** Development of Leadership Resources for Activity Based Costing (ABC)  
**Summary:** This project will develop databases including one for an Army wide ABC effort tracking system, a dictionary of Army activities and related statistics, an Army Service Based Cost (SBC) dictionary linked to the ABC dictionary, and a separate database for tracking membership in the ABC Policy steering committee.  
**Classification:** Unclassified  
**Sponsor:** US Army Cost and Economic Analysis Center  
**Performer:** Calibre Systems Inc.  
**Resources:** FY            Dollars            Staff-years  
97            \$155,000  
**Schedule:** Start            End  
Sep 96            Sep 97  
**Data Base:**  
**Publications:**  
**Category:** I.A  
**Keywords:** Government, Estimating, Analysis, Budgeting

**CEAC-22**

**Title:** Link Activity Based Costs (ABC) to Service Based Costs (SBC)

**Summary:** This project will develop prototype linkage tracing Activity Based Costs to Service Based Costs at installations where ABC has been implemented. This task supports Army wide ABC capability needed to help train and administer the Army managerial costing policy. The linkage of ABC and SBC will support the VCSA requirement that ABC support higher HQ efforts such as SBC. Linking ABC and SBC efforts will reduce duplication of data collection, budget reconciliation, and cost validation.

**Classification:** Unclassified

**Sponsor:** U S Army Cost and Economic Analysis Policy

**Performer:** Calibre Systems Inc.

**Resources:** FY            Dollars            Staff-years  
96            \$100,000

**Schedule:** Start            End  
Sep 96            Sep 97

**Data Base:**

**Publications:**

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Infrastructure, Study

**CEAC-23**

**Title:** Aircraft Module Data Base Transition

**Summary:** This project will provide products to improve the capability of the Aircraft Cost Analyst to develop accurate cost estimates as high technology products and processes increase in Aircraft systems. This project includes the transition of the Aircraft Module Database in Automated Cost Database (ACDB) to a new contractor to perform the Army Aircraft DBA tasks.

**Classification:** Unclassified

**Sponsor:** US Army Cost and Economic Analysis Center

**Performer:** Ketron  
Phil Wilson

**Resources:** FY            Dollars            Staff-years  
97            \$125,000

**Schedule:** Start            End  
Apr 98            Apr 99

**Data Base:** Automated Cost Data Base (ACDB)

**Publications:**

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Aircraft, Electronics/Avionics, Data Base

**ARMY MATERIEL COMMAND**

<b>Name</b>	U.S. Army Materiel Command, Cost Analysis Division	
<b>Address</b>	U.S. Army Materiel Command, Cost Analysis Division 5001 Eisenhower Avenue Alexandria, VA 22333-0001	
<b>Director</b>	Ms. Maryann Dominiak, (703) 617-9100	
<b>Size</b>	Professional:	13
	Support:	1
	Consultants:	0
	Subcontractors:	1
<b>Focus</b>		
<b>Activity</b>	Number of projects in process:	1
	Average duration of a project:	3 years
	Average number of staff members assigned to a project:	1
	Average number of staff-years expended per project:	0.5
	Percentage of effort conducted by consultants:	0%
	Percentage of effort conducted by subcontractors:	25%

**AMCRM-1**

**Title:** ACE-IT Verification and Validation Tool

**Summary:** This project funds the development of a Verification and Validation Tool using ACE-IT and the ACE Executive to facilitate analysts' validation efforts. This tool will automatically access a set of 'decision rules' to evaluate ACE-IT output runs and quickly focus in on areas that need review. The application of artificial intelligence techniques such as knowledge based or expert systems and artificial neural networks will be evaluated for possible adoption.

**Classification:** Unclassified

**Sponsor:** HQ AMC

Mr. Rex Stone

Phone: (703) 617-9102; DSN: 767-9102

FAX: (703) 617-8425

Email: rstone@hqamc.army.mil

Information Management Support Center Funded

**Performer:** Tecolote Research Inc.

John McGahan

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$45,000 OMA	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Aug 97	Mar 98

**Data Base:** IBM PC Compatible

**Publications:** Tecolote ACE-IT Users Guide

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Analysis, Weapon Systems, Life Cycle, Statistics/Regression, Expert System

**ARMY TANK-AUTOMOTIVE AND ARMAMENTS COMMAND**

<b>Name</b>	Cost Analysis Division U.S. Army Tank-automotive and Armaments Command	
<b>Address</b>	AMSTA-RM-V Warren, MI 48397-5000	
<b>Director</b>	Richard S. Bazzzy, (810) 574-6665; E-mail: bazzzyr@cc.tacom.army.mil	
<b>Size</b>	Professional:	—
	Support:	—
	Consultants:	—
	Subcontractors:	—
<b>Focus</b>	Responsible for the preparation of Program Office Estimates, Life Cycle Cost Estimates, and Economic Analyses. Perform cost validation to determine the reasonableness of cost estimates. Support the Earned Value Management Process. Develop cost models and data bases along with performing cost research. Support is provided to combat and combat support vehicle systems.	
<b>Activity</b>	Number of projects in process:	15
	Average duration of a project:	3–20 weeks
	Average number of staff members assigned to a project:	1–3
	Percentage of effort conducted by consultants:	0%
	Percentage of effort conducted by subcontractors:	0%

## TACOM-1

**Title:** Performance Affordability Assessment Model (PAAM)

**Summary:** The objective of this modeling effort is to develop a cost model that will perform Cost as an Independent Variable (CAIV) trades utilizing not only cost, but also technical performance/effectiveness type information. Model will allow users to vary weapon system component level technical performance and see the resulting impact on system level cost and operational effectiveness.

**Classification:** Unclassified

**Sponsor:** US Army Tank-automotive and Armaments Command  
AMSTA-RM-V  
Richard Bazzy, (810) 574-6665

**Performer:** US Army Tank-automotive and Armaments Command  
AMSTA-RM-VC  
Diane Hohn, (810) 574-8693; Lawrence Delaney

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	\$326,000	4.5
	(to date)	(to date)

**Schedule:**

<u>Start</u>	<u>End</u>
May 94	Sep 98

**Data Base:** None

**Publications:** None

**Category:** II.B

**Keywords:** Government, Estimating, Weapon Systems, Life Cycle, Advanced Technology, Cost/Production Function, Computer Model.



**ARMY AVIATION AND MISSILE COMMAND**

<b>Name</b>	U.S. Army Aviation and Missile Command Command Analysis Division		
<b>Address</b>	AMSAM-CA Redstone Arsenal, AL 35898		
<b>Director</b>	Mr. Frank T. Lawrence, (256) 842-2817		
<b>Size</b>	Professional:	78	
	Support:	9	
	Consultants:	0	
	Subcontractors:	1	
<b>Focus</b>	Program Office Estimates, Cost studies, Economic analysis, Analytical studies, Cost Performance Report (CPR) analyses, Effectiveness analyses, Validation of cost studies		
<b>Activity</b>	Provides analytical support to AMCOM functional organizations, PEO Aviation, PEO Tactical Missiles, and other tenant activities		

**No Summaries Submitted**

**ARMY SPACE AND MISSILE DEFENSE COMMAND**

<b>Name</b>	U.S. Army Space and Strategic Defense Command	
<b>Address</b>	CCSD-TC-PC 106 Wynn Drive, P.O. Box 1500 Huntsville, AL 35807	
<b>Director</b>	Ms. Carolyn S. Thompson, TA&I Director, (205) 955-3069 Mr. Jackson G. Calvert, Cost Analysis Division Chief, (205) 955-3612	
<b>Size</b>	Professional:	11
	Support:	0
	Consultants:	Mevatech Corporation
	Subcontractors:	SAIC
<b>Focus</b>	Systems Costs, Component Cost Analyses, Economic Analyses	
<b>Activity</b>	Number of projects in process:	TBD
	Average duration of a project:	3 years
	Average number of staff members assigned to a project:	1
	Average number of staff-years expended per project:	0.25
	Percentage of effort conducted by consultants:	25%
	Percentage of effort conducted by subcontractors:	40%

## SMDC-1

**Title:** Software Cost Estimating

**Summary:** Primary DOD software cost estimating methods are models which require numerous subjective inputs (e.g., COCOMO, REVIC, etc.). In those cases where there is little knowledge of the subjective variables required to utilize these models, significantly large errors can result. The subject software estimating research provides alternative estimating methods, based on historical DOD costs, which may be used to verify/validate subjective models, or be used as standalone models. Estimating models include those expressly intended for use on each of missiles, radars, BMC<sup>3</sup> and support systems. Unlike most subjective models, the database is known, and each is derived utilizing real historical data from each model category.

**Classification:**

**Sponsor:** Bill Hughes, (205) 955-5913, (hughesb@smdc.army.mil)

**Performer:** SAIC

Bill Hughes, Vicki Kitchens, and Tom Odom

**Resources:** FY Dollars Staff-years

\$70,000

**Schedule:** Start End

Apr 97 Oct 97

**Data Base:** Title:

Description: DOD systems

Automation: Strategic and Theater Automated Research (STAR)

**Publications:** *Software Cost Estimating Methodology*, Vicki Kitchens and Tom Odom

**Category:** II.A.2

**Keywords:** Estimating, Software, Missiles, Electronics/Avionics, Data Base, Method

## SMDC-2

**Title:** Laser Research

**Summary:** Lasers remain an important weapon system candidate for ballistic missile defense, yet relatively little formal cost estimating methodology exists. The subject cost research focuses on research and estimating methodology development for chemical and diode-pumped solid state lasers, and pointing and tracking systems.

**Classification:**

**Sponsor:** Bill Hughes, (205) 955-5913, (hughesb@smdc.army.mil)

**Performer:** SAIC

Rick Taylor

**Resources:** FY Dollars Staff-years

\$70,000

**Schedule:** Start End

Apr 97 Dec 97

**Data Base:** Title:

Description: DOD systems

**Automation:** Strategic and Theater Automated Research (STAR)  
**Publications:** *Laser Cost Research*, Rick Taylor  
**Category:** II.A.2  
**Keywords:** Estimating, Missiles, Electronics/Avionics, Advanced Technology, Method

## SMDC-3

**Title:** Multi-Mode Seeker Cost Research

**Summary:** Recent developments in modern missile seeker technology have included the combination of widely different spectral bands in a single unit to overcome problems caused by degradation of signals due to weather conditions and other natural and man-made signal obscurants. As multi-mode seeker designs become more prevalent, better estimating methods are required to account for differences in design and integration of emerging technologies associated with these multi-mode seekers. This report documents cost research into the development of cost estimating relationships for both infrared and radio frequency seekers, and their integration.

**Sponsor:** Jack Calvert, (205) 955-3612, (calvertj@smdc.army.mil)

**Performer:** SAIC  
 Jack Calvert and Robert Hatton

**Resources:** FY                      Dollars                      Staff-years  
    \$150,000

**Schedule:**    Start                      End  
                          Mar 97                      Dec 97

**Data Base:** Title:  
                          Description:    DOD systems  
                          Automation:    Strategic and Theater Automated Research (STAR)

**Publications:** *Multi-Mode Seeker Cost Research*, Robert Hatton

**Category:** II.A.2

**Keywords:** Estimating, Missiles, Electronics/Avionics, Advanced Technology, Method, CER

**NAVAL CENTER FOR COST ANALYSIS**



<b>Name</b>	Naval Center for Cost Analysis (NCCA)	
<b>Address</b>	1111 Jefferson Davis Highway Suite 400, West Tower Arlington, VA 22202-4306	
<b>Director</b>	Dr. Daniel A. Nussbaum, (703) 604-0293 CAPT John E. Fink, Deputy Director, (703) 604-0308 Mr. Rick Collins, Technical Director, (703) 604-0280	
<b>Size</b>	Total:	37 civilian; 15 military
	Professional:	31 civilian; 15 military
<b>Focus</b>	<p>Naval Center for Cost Analysis (NCCA) is responsible for assisting (via IPTs) in the preparation of life cycle cost estimates for DoN weapon and automated information systems, administering the DoN Contractor Cost Data Reporting (CCDR) program, managing the DoN VAMOSC Program and coordinating the DoN cost research program.</p> <p>The focus of the NCCA cost research program is the following: improved acquisition and operating and support (O&amp;S) cost/technical data bases (e.g., VAMOSC, ACDB, etc.); improved methods for estimating direct and indirect O&amp;S costs; improved methods for estimating software development/maintenance costs; improved methods for estimating specific E&amp;MD cost elements, e.g., non-recurring engineering, system integration, government in-house support, etc.; methods for estimating the cost impact of acquisition reform initiatives.</p>	
<b>Activity</b>	Number of projects in process:	18
	Average duration of a project:	43.9 months
	Average number of staff members assigned to a project:	1-2
	Average number of staff-years expended per project:	2-3
	Percentage of effort conducted by consultants:	59%
	Percentage of effort conducted by subcontractors:	0%

## NCCA-1

**Title:** Top-Level Ship Operating and Support Cost Model

**Summary:** A parametric cost estimating model is being created that estimates annual ship operating and support costs as a function of such characteristics as light ship displacement, overall length, number of officers assigned, and number of enlisted assigned.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Jack Smuck, (703) 604-0292

**Performer:** NCCA in-house  
Mr. Paul Hardin, (703) 604-0290

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96		0.25
98		0.1

**Schedule:**

<u>Start</u>	<u>End</u>
Jan 96	Sep 98

**Data Base:** VAMOSC/other cost data and technical data

**Publications:** Report and appropriate spreadsheet files

**Category:** II.A.2

**Keywords:** Government, Estimating, Operations and Support, Statistics/Regression, Computer Model

## NCCA-2

**Title** Ship Operating and Support Cost Analysis Model (OSCAM-Ship)

**Summary:** This model was developed using a "system dynamics" approach. This approach provides a structured methodology for dealing with complex systems having many interacting components. A system dynamics approach enables us to capture the dynamic behavior of a system while allowing for a flexible design which can be easily enhanced and expanded. The model provides the flexibility for fast, top-level cost estimating, as well as the framework for analyzing possible policy decisions and their impact on cost and availability. Model outputs include both cost and availability. The inclusion of availability within the model is crucial because cost reduction policies need to be analyzed in conjunction with their impact on availability, and vice versa.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
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Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Jack Smuck, (703) 604-0292

**Performer:** NCCA in-house and British MoD  
Mr. Paul Hardin, (703) 604-0290  
Ms. Colleen McAuliffe, (703) 604-0271  
LT Lee Lavinder, (703) 604-0279

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	UK funds	0.75	00	\$25,000	0.25
98	\$61,500	0.5	01	\$25,000	0.25
99	\$25,000	0.25	02	\$25,000	0.25

**Schedule:**

<u>Start</u>	<u>End</u>	
Jan 97	Nov 97	Version 1 development
Dec 97	Feb 98	Version 2 development
Mar 98	Sep 02	Version 3 development and model maintenance

**Data Base:** VAMOSC/other cost data and technical data

**Publications:** Mathematical model with supporting documentation

**Categories:** II.B, II.C, II.D

**Keywords:** Government, Estimating, Analysis, Operations and Support, Sustainability, Ships, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

### NCCA-3

**Title:** Shipboard Systems Operating and Support Cost Analysis Model (OSCAM-Sys)

**Summary:** This model was developed using a "system dynamics" approach. This approach provides a structured methodology for dealing with complex systems having many interacting components. A system dynamics approach enables us to capture the dynamic behavior of a system while allowing for a flexible design which can be easily enhanced and expanded. The model provides the flexibility for fast, top-level cost estimating, as well as the framework for analyzing possible policy decisions and their impact on cost and availability. Model outputs include both cost and availability. The inclusion of availability within the model is crucial because cost reduction policies need to be analyzed in conjunction with their impact on availability, and vice versa.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
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Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Jack Smuck, (703) 604-0292

**Performer:** NCCA in-house and British MoD  
Mr. Paul Hardin, (703) 604-0290  
Ms. Collen McAuliffe, (703) 604-0271  
LT Lee Lavinder, (703) 604-0279

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96	UK Funds	1.0	00	\$25,000	0.25
97	UK Funds	0.75	01	\$25,000	0.25
98	\$61,500	0.25	02	\$25,000	0.25
99	\$25,000	0.25			

**Schedule:**

<u>Start</u>	<u>End</u>	
Jan 96	Jun 97	Version 1 development
Jul 97	Jan 98	Version 2 development
Feb 98	Sep 02	Version 3 development and model maintenance

**Data Base:** VAMOSC/other cost data and technical data

**Publications:** Mathematical model with supporting documentation

**Categories:** II.B, II.C, II.D

**Keywords:** Government, Estimating, Analysis, Operations and Support, Sustainability, Weapon Systems, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

## NCCA-4

**Title:** Aircraft Operating and Support Cost Model

**Summary:** This model will be developed using a "system dynamics" approach. This approach provides a structured methodology for dealing with complex systems having many interacting components. A system dynamics approach enables us to capture the dynamic behavior of a system while allowing for a flexible design which can be easily enhanced and expanded. Many questions posed today (e.g., How can the Navy reduce operating and support costs while maintaining readiness?) cannot be addressed with existing tools. The model will provide the flexibility for fast, top-level cost estimating, as well as the framework for analyzing possible policy decisions and their impact on cost and availability. Model outputs will include both cost and availability. The inclusion of availability within the model is crucial because cost reduction policies need to be analyzed in conjunction with their impact on availability, and vice versa.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Bill Stranges, (703) 604-0310

**Performer:** Contractor TBD  
NCCA in-house

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	01	\$104,000	1.0
	02	\$53,000	0.5

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 00	Sep 02 (development)

**Data Base:** VAMOS/other cost data and technical data

**Publications:** Mathematical model with supporting documentation

**Categories:** II.B, II.C, II.D

**Keywords:** Government, Estimating, Analysis, Operations and Support, Sustainability, Aircraft, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

## NCCA-5

**Title:** Avionics Operating and Support Cost Model

**Summary:** This model will be developed using a "system dynamics" approach. This approach provides a structured methodology for dealing with complex systems having many interacting components. A system dynamics approach enables us to capture the dynamic behavior of a system while allowing for a flexible design which can be easily enhanced and expanded. Many questions posed today (e.g., How can the Navy reduce operating and support costs while maintaining readiness?) cannot be addressed with existing tools. The model will provide the flexibility for fast, top-level cost estimating, as well as the framework for analyzing possible policy decisions and their impact on cost and availability. Model outputs will include both cost and availability. The inclusion of

availability within the model is crucial because cost reduction policies need to be analyzed in conjunction with their impact on availability, and vice versa.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Bill Stranges, (703) 604-0310

**Performer:** Contractor TBD  
NCCA in-house

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	99	\$100,000	1.0	01	\$25,000	0.25
	00	\$50,000	0.5	02	\$25,000	0.25

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 98	Sep 00 (development)
	Oct 00	Sep 02 (maintenance)

**Data Base:** VAMOSC/other cost data and technical data

**Publications:** Mathematical model with supporting documentation

**Categories:** II.B, II.C, II.D

**Keywords:** Government, Estimating, Analysis, Operations and Support, Sustainability, Electronics/Avionics, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

## NCCA-6

**Title:** Missile and Torpedo Operating and Support Cost Model

**Summary:** This model will be developed using a "system dynamics" approach. This approach provides a structured methodology for dealing with complex systems having many interacting components. A system dynamics approach enables us to capture the dynamic behavior of a system while allowing for a flexible design which can be easily enhanced and expanded. Many questions posed today (e.g., How can the Navy reduce operating and support costs while maintaining readiness?) cannot be addressed with existing tools. The model will provide the flexibility for fast, top-level cost estimating, as well as the framework for analyzing possible policy decisions and their impact on cost and availability. Model outputs will include both cost and availability. The inclusion of availability within the model is crucial because cost reduction policies need to be analyzed in conjunction with their impact on availability, and vice versa.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Jack Smuck, (703) 604-0292

**Performer:** NCCA in-house  
Mr. Paul Hardin, (703) 604-0290

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
00	\$100,000	1.0
01	\$50,000	0.5
02	\$25,000	0.25

**Schedule:**

<u>Start</u>	<u>End</u>
Oct 98	Sep 01 (development)
Oct 01	Sep 02 (maintenance)

**Data Base:** VAMOSC/other cost data and technical data

**Publications:** Mathematical model with supporting documentation

**Categories:** II.B, II.C, II.D

**Keywords:** Government, Estimating, Analysis, Operations and Support, Sustainability, Missiles, Mathematical Modeling, Statistics/Regression, Data Base, Method, CER, Study

## NCCA-7

**Title:** Cost of a Sailor Study

**Summary:** This study determined the variable indirect costs (infrastructure costs) associated with manpower assigned to the at-sea operating forces. Variable indirect cost factors that distinguish between officer and enlisted personnel and further distinguish between officer communities (i.e., aviation, surface warfare, submarines, etc.) were developed. The study has been completed and study results have been incorporated into COMET.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
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Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Jack Smuck, (703) 604-0292

**Performer:** NCCA in-house  
Mr. Leonard Cheshire, (703) 604-0285

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96		0.25
97		0.25
98		0.25

**Schedule:**

<u>Start</u>	<u>End</u>
FY96	Dec 97

**Data Base:** Personnel Cost Estimating Database/Model

**Publications:** Results being incorporated into NCCA's Cost of Manpower Estimating Tool (COMET)

**Category:** II.C

**Keywords:** Government, Infrastructure, Study, Manpower/Personnel

## NCCA-8

**Title:** Cost of Manpower Estimating Tool (COMET)

**Summary:** The Navy Billet Cost Factor Cost Estimation Model has been updated, revised, and reformatted to distinguish between direct manpower costs and variable indirect manpower costs. The study was completed at the end of FY97; additional work in FY98

focuses on the development of training modules, conducting training sessions and improving the COMET model's application to other systems that develop manpower requirements.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Jack Smuck, (703) 604-0292

**Performer:** SAG Corporation  
900 S. Washington St., #109  
Falls Church, VA 22046  
Mr. Pat Mackin, (703) 538-4500

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$119,000	0.1	00	\$80,000	0.25
	98	\$77,000	0.25	01	\$82,000	0.25
	99	\$79,000	0.25	02	\$84,000	0.25

**Schedule:** Start End  
FY97 FY97 (initial update/revision)  
FY98 FY02 (annual updates)

**Data Base:** Revised Navy Billet Cost Factors/Model

**Publications:** Mathematical model with supporting documentation

**Category:** II.C

**Keywords:** Infrastructure, Study, Government, Manpower/Personnel

## NCCA-9

**Title:** Integration of Navy VAMOSC Database into a Relational Database Management System

**Summary:** Integration of the current weapon system operating and support (O&S) cost data into a relational database management system was initiated in FY96 and completed in FY97. The inefficient and incompatible system of batch processing and paper report distribution was replaced with a Tier II client-server application. VAMOSC users now have the ability to directly access detailed and summary level data

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Ms. Cheri Cummings, (703) 604-0275

**Performer:** Information Spectrum, Inc.  
NCCA in-house  
CDR Walter Bednarski, (703) 604-0273

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	96	\$1,000,000	1.5
	97	\$700,000	1.5

**Schedule:** Start End  
Oct 95 Sep 97

**Data Base:** VAMOSC Ships, Air, Missile, and Torpedo Data  
**Publications:** Documentation of system  
**Category:** II.A.2  
**Keywords:** Government, Operations and Support, Data Collection, Data Base

## NCCA-10

**Title:** Expansion of VAMOSC Shipboard Systems Database  
**Summary:** This effort is expanding the VAMOSC Shipboard Systems cost database by ten or more systems annually, including electronics, launching, and gun systems.  
**Classification:** Unclassified  
**Sponsor:** Naval Center for Cost Analysis  
 1111 Jefferson Davis Highway  
 Suite 400, West Tower  
 Arlington, VA 22202-4306  
 Ms. Cheri Cummings, (703) 604-0275  
**Performer:** Information Spectrum, Inc.  
 NCCA in-house  
 CDR Walter Bednarski, (703) 604-0273

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	96	\$170,000	0.1	00	\$170,000	0.1
	97	\$170,000	0.1	01	\$170,000	0.1
	98	\$170,000	0.1	02	\$170,000	0.1
	99	\$170,000	0.1	03	\$170,000	0.1

**Schedule:** Start End  
 FY96 FY03

**Data Base:** VAMOSC Shipboard Systems  
**Publications:** VAMOSC Shipboard Systems Report  
**Category:** II.A.2  
**Keywords:** Government, Operations and Support, Data Collection, Data Base

## NCCA-11

**Title:** Indirect Cost Database Related to the VAMOSC Database  
**Summary:** This effort is investigating the types of indirect cost, determining sources for this cost data, determining how the costs can be related to VAMOSC, and allocating the costs to weapons systems.  
**Classification:** Unclassified  
**Sponsor:** Naval Center for Cost Analysis  
 1111 Jefferson Davis Highway  
 Suite 400, West Tower  
 Arlington, VA 22202-4306  
 Ms. Cheri Cummings, (703) 604-0275  
**Performer:** Information Spectrum, Inc.  
 Mathtech, Inc.



NCCA in-house  
Robert Hiram, (703) 604-0303

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96	\$300,000	0.1
97	\$85,000	0.1
98	\$85,000	0.3
99	\$85,000	0.3

**Schedule:**

<u>Start</u>	<u>End</u>
FY96	FY99

**Data Base:** VAMOSC Ships, Air, Missile, and Torpedo Data, STARS, WINPAT

**Publications:** Enhanced database with documentation

**Category:** II.C

**Keywords:** Government, Operations and Support, Infrastructure, Data Base

## NCCA-12

**Title:** Linkage Between VAMOSC and the PPBS

**Summary:** This research investigated and documented the links between the historical, accounting cost data in VAMOSC and the planning and budgeting data in the PPBS. Tracking and consistency were established between the two systems in order to determine the completeness of the VAMOSC data and to allow VAMOSC to be used to do better planning and budgeting.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Ms. Cheri Cummings, (703) 604-0275

**Performer:** Mathtech, Inc.  
NCCA in-house  
CDR Walter Bednarski, (703) 604-0273

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96	\$160,000	0.1
97	\$100,000	0.1

**Schedule:**

<u>Start</u>	<u>End</u>
Apr 96	Sep 97

**Data Base:** VAMOSC Ships, Air, Missile, and Torpedo Cost and Budget Data.

**Publications:** *Enhancing VAMOSC through Utilization of PPBS Data Structures*, Mathtech, Inc., August 1997.

**Category:** II.B

**Keywords:** Government, Operations and Support, Programming, Budgeting, Study

## NCCA-13

**Title:** Platform Integration Cost Database/Model for Electronics

**Summary:** A database and cost estimating methodology will be developed for projecting hardware integration and hardware/software integration costs for shipboard and airborne electronics. The database should include cost data, technical characteristics, and other relevant information (e.g., software size) for a variety of systems, including sonar, radar, fire control, EW, and launching systems. The cost data should include relevant contractor and Navy in-house costs.

**Classification:** Cost Data: Business Sensitive  
Technical Characteristics: Classified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Rick Collins, (703) 604-0280

**Performer:** Contractor TBD  
NCCA in-house

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
99	\$157,000	0.25
00	\$161,000	0.25
01	\$55,000	0.25
02	\$56,000	0.1

**Schedule:**

<u>Start</u>	<u>End</u>
FY99	FY02

**Data Base:** Ship Systems Electronics Cost and Technical Characteristics

**Publications:** TBD

**Category:** II.A.2

**Keywords:** Government, Estimating, Weapon Systems, Missiles, Ships, Aircraft, Electronics/Avionics, EMD, Production, Data Collection, Data Base, Method

## NCCA-14

**Title:** Government In-House Cost Database/Estimating Methodology

**Summary:** A cost database and methodology will be developed for estimating government in-house (GIH) development and procurement costs for ships, shipboard systems, aircraft and airborne systems. The database should include cost and other relevant information for a variety of platforms and systems, including sonar, radar, fire control, EW, launcher, etc.

**Classification:** Cost Data: Business Sensitive  
Technical Characteristics: Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Rick Collins, (703) 604-0280

**Performer:** Contractor TBD

NCCA in-house

<b>Title:</b>	Missile Special Tooling and Test Equipment Cost Estimating Relationship		
<b>Summary:</b>	The purpose of this study is to update the "Cost Estimating Relationships for Tactical Missile Special Tooling and Test Equipment (ST&TE)" study developed by Science Applications International Corporation in February 1986.		
<b>Classification:</b>	Unclassified		
<b>Sponsor:</b>	Naval Center for Cost Analysis 1111 Jefferson Davis Highway Suite 400, West Tower Arlington, VA 22202-4306 Mr. Bill Stranges, (703) 604-0310		
<b>Performer:</b>	NCCA in-house		
<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98		0.5
<b>Schedule:</b>	<u>Start</u>	<u>End</u>	
	Mar 98	Sep 98	
<b>Data Base:</b>	Historical cost data obtained from the government program offices and tactical missile manufacturers for Navy missile programs.		
<b>Publications:</b>	Completed study report		
<b>Category:</b>	II.A.1		
<b>Keywords:</b>	Government, Estimating, Analysis, Missiles, EMD, Production, Production Rate, Data Collection, Statistics/Regression, Data Base, Method, CER, Study		

**NCCA-16**

<b>Title:</b>	Rotary Wing Aircraft Cost Database
<b>Summary:</b>	In the course of building cost estimates for aircraft currently in development, it was determined that there is a lack of detailed and normalized data from previous development and production efforts. The Naval Air Systems Command (NAVAIR) Cost Competency (Code 4.2) has initiated a broad effort to organize, analyze, and document historical government and contractor cost data reports for propulsion, avionics, fixed

wing airframes, and rotary wing airframes. The Naval Center for Cost Analysis (NCCA) is assisting NAVAIR in developing the rotary wing airframe database. This NCCA project is related to NAVAIR-9.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command (AIR 4.2)  
22347 Cedar Point Road, Unit 6  
Patuxent River, MD 20670-1161  
Mr. Joe Incorvia, (301) 342-2342

Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

Mr. Bill Stranges, (703) 604-0310

**Performer:** NAVAIR 4.2 in-house  
Mr. Gary Newton, (301) 757-2311  
NCCA in-house

Mr. Dave Stem, (703) 604-0298  
Mr. Matthew Schmit, (703) 604-0283

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years (NCCA)</u>
	98		0.67
	99		0.33

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Apr 98	Dec 98

**Data Base:** Historical cost data obtained from the government and aircraft manufacturers including CCDRs and internal contractor reports.

**Publications:** Detailed, normalized cost and technical database.

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Analysis, Aircraft, Helicopters, EMD, Production, Production Rate, Data Collection, Statistics/Regression, Data Base, Method, CER, Study

## NCCA-17

**Title:** Missile Development Cost Estimating Model

**Summary:** The purpose of this study is update missile development cost estimating methodologies that have been used by NCCA over the past decade. These methodologies are underpinned by development programs from the 1970's and early 1980's, at least one generation of technology behind the current state of the art. This study will update these methodologies to reflect 1990's missile development efforts and integrate them into a comprehensive cost model.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
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Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Bill Stranges, (703) 604-0310

**Performer:** NCCA in-house

Mr. Jeff Cherwonik, (703) 604-0272  
 Mr. Jeff Wolfe, (703) 604-0296

**Resources:** FY            Dollars            Staff-years  
                   98                                    1.0

**Schedule:**    Start            End  
                   Mar 98            Sep 98

**Data Base:**    Missile CCDRs and CPRs, ACDB

**Publications:** Completed study report and cost model.

**Category:**     II.A.1

**Keywords:**    Government, Estimating, Missiles, EMD, Statistics/Regression, Mathematical Model

## NCCA-18

**Title:**            Electronics Cost/Technical Database

**Summary:**     A Navy electronics module for the Automated Cost Database (ACDB) is being developed. The database will include development/production cost, technical and programmatic data for a variety of shipboard and airborne electronics systems, including sonar, radar, fire control, and electronic warfare systems.

**Classification:** Unclassified

**Sponsor:**      Naval Center for Cost Analysis  
                   1111 Jefferson Davis Highway  
                   Suite 400, West Tower  
                   Arlington, VA 22202-4306  
                   Mrs. Cheri Cummings, (703) 604-0275

**Performer:**    Tecolote Research, Inc.  
                   1700 N. Moore Street, Suite 1400  
                   Arlington, VA 22209  
                   (703) 243-2800  
                   NCCA in-house  
                   Ms. Pamela Johnson, (703) 604-0294; Mr. Don Clarke, (703) 604-0282

**Resources:**    FY            Dollars            Staff-years            FY            Dollars            Staff-years  
                   97            \$75,000            0.25            00            \$80,000            0.25  
                   98            \$0            0.25            01            \$82,000            0.25  
                   99            \$79,000            0.25            02            \$84,000            0.25

**Schedule:**    Start            End  
                   Jul 97            Sep 02

**Data Base:**    Navy ACDB Electronics Module with Cost and Technical Data

**Publications:** TBD

**Categories:**    II.A.1, II.A.2

**Keywords:**    Government, Estimating, Analysis, Electronics/Avionics, EMD, Production, CPR/CCDR, Data Collection, Data Base

**NCCA-19**

**Title:** MADCAM (Microwave and Digital Cost Analysis Model)

**Summary:** The model is being populated with additional data. MADCAM estimates the first unit production cost (i.e.,  $T_1$ ) of electronics boxes in FY90 as a function of their distinguishing design characteristics and the technology of the components. This task was started in 1992 under an Air Force contract, and was then transferred to the Navy in late 1994. The model is in its fourth release and is called "MADCAM 96." It contains 83 data points covering space, air, and surface programs.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Scott E. Hine, (703) 602-5769

**Performer:** Tecolote Research, Inc.  
Mr. John Hicks

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
95	\$81,700	
97	\$103,000	

**Schedule:**

<u>Start</u>	<u>End</u>	
Sep 95	Feb 96	Data collection
Sep 96	Jun 98	Model refinement

**Data Base:** Electronic boxes cost and technical data

**Publications:** MADCAM 96 (Microwave and Digital Cost Analysis Model) Presentation Document, 29 February 1996

**Category:** I.B.1

**Keywords:** Government, Estimating, Missiles, EMD, Manufacturing, Data Collection, Computer Model

**NCCA 20**

**Title:** Transmit/Receive (T/R) Module Update

**Summary:** The current Tecolote cost model for solid state Transmit/Receive Modules was first released in 1991. The updated model will incorporate data from the following programs: GBR, International COBRA, CEC, and possibly F-22.

**Classification:** Secret

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Mr. Scott E. Hine, (703) 602-5769

**Performer:** Tecolote Research, Inc.  
Mr. Duncan Thomas

**Resources:** FY Dollars Staff-years  
 97 \$115,000

**Schedule:** Start End  
 Mar 97 Aug 98

**Data Base:** T/R Module Cost/Technical Data

**Publications:** An updated user manual and model documentation will be provided upon task completion.

**Category:** II.A.1

**Keywords:** Government, Estimating, Analysis, Electronics/Avionics, Space Systems, Production, Labor, Material, Data Collection, Computer Model

## NCCA-21

**Title:** Software Development Estimating Handbook - Phase One

**Summary:** This handbook is a comprehensive software development estimating manual that provides: a) a centralized and well-documented compilation of existing databases; and b) formal procedures, tools, and guidelines for developing software effort, schedule, cost, and risk (growth) estimates. Raw effort database consists of 457 data points, including 151 program-level and 306 CSCI-level data points.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
 1111 Jefferson Davis Highway  
 Suite 400, West Tower  
 Arlington, VA 22202-4306  
 Mrs. Cheri E. Cummings, (703) 604-0275

**Performer:** NCCA in-house  
 Ms. Pamela L. Johnson, (703) 604-0294

**Resources:** FY Dollars Staff-years  
 95 4  
 96 2  
 97 1  
 98 1

**Schedule:** Start End  
 Jan 95 Feb 98

**Data Bases:** Separate NCCA software databases covering effort, schedule, labor rate and SLOC growth

**Publications:** *Software Development Estimating Handbook - Phase One*, Naval Center for Cost Analysis, February 1998

**Categories:** II.A.2, II.C, II.D

**Keywords:** Government, Analysis, Electronics/Avionics, Life Cycle, Data Collection, Data Base, Schedule, Risk/Uncertainty

**NCCA-22**

**Title:** Weapon System Development Cost/Technical Database

**Summary:** This effort will entail maintaining/updating the NCCA software effort, schedule, labor rate, and SLOC growth databases developed for the *NCCA Software Development Estimating Handbook* (see NCCA-21). Near-term effort will target the collection of shipboard, avionics, and aircraft systems software development cost/technical data points.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Mrs. Cheri E. Cummings, (703) 604-0275

**Performer:** MCR Federal, Inc.  
4165 E. Thousand Oaks Boulevard, Suite 235  
Thousand Oaks, CA 91362-3810  
(805) 496-7111  
NCCA in-house  
Ms. Pamela L. Johnson, (703) 604-0294

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$50,000	0.1	01	\$82,000	0.1
98	\$100,000	0.1	02	\$84,000	0.1
99	\$79,000	0.1	00	\$80,000	0.1

**Schedule:** Start End  
Jul 97 Sep 02

**Data Base:** Separate NCCA software databases covering effort, schedule, labor rate and SLOC growth

**Publications:** TBD

**Categories:** II.A.1, II.A.2, II.C

**Keywords:** Government, Analysis, Electronics/Avionics, Life Cycle, Software, Data Collection, Data Base, Schedule, Risk/Uncertainty

**NCCA-23**

**Title:** Weapon System Software Development Estimating Methodology Update

**Summary:** This effort will entail maintaining/updating the NCCA software effort, schedule, labor rate, and SLOC growth estimating methodologies developed for the *NCCA Software Development Estimating Handbook* (see NCCA-21). Effort will include updating the current software development estimating tools and documenting the results. Additionally, effort will target the identification and assessment of commercially available software development estimating methodologies.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306



**Performer:** Mrs. Cheri E. Cummings, (703) 604-0275  
Contractor, TBD  
NCCA in-house  
Ms. Pamela L. Johnson, (703) 604-0294

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
99	\$78,500	0.25	01	\$41,000	0.25
00	\$80,500	0.25	02	\$42,000	0.25

**Schedule:** Start End  
Oct 98 Sep 02

**Data Base:** TBD

**Publications:** Update of the NCCA *Software Development Estimating Handbook*

**Categories:** II.A.1, II.A.2, II.C

**Keywords:** Government, Analysis, Electronics/Avionics, Life Cycle, Software, Data Collection, Data Base, Schedule, Risk/Uncertainty

## NCCA-24

**Title:** Weapon System Software Maintenance Cost/Technical Database and Estimating Methodology

**Summary:** Software maintenance metrics and cost data will be collected on a variety of weapon systems. The initial effort will focus on shipboard electronic systems. This data will be used to develop software maintenance arrival/closure distribution curves and cost estimating relationships/factors. Follow-on efforts will focus on avionics and other aircraft software. This effort is a continuation of the NSWCD project entitled, "Software Maintenance Cost Process Model."

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Ms. Cheri Cummings, (703) 604-0275

**Performer:** Technomics, Inc.  
5290 Overpass Road #206  
Santa Barbara, CA 93111  
(805) 964-9894

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96	\$74,000	0.1	00	\$80,000	0.15
97	\$50,000	0.1	01	\$82,000	0.15
98	\$100,000	0.1	02	\$84,000	0.15
99	\$79,000	0.15			

**Schedule:** Start End  
Feb 96 Sep 02

**Data Base:** TBD

**Publications:** TBD

**Categories:** II.A.1, II.A.2, II.C

**Keywords:** Government, Estimating, Software, Data Collection, Statistics/Regression, Data Base, CER, Operations and Support

**NCCA-25**

**Title:** Automated Information System (AIS) Software Cost/Technical Database and Estimating Methodology

**Summary:** This effort will: a) collect AIS software development and maintenance cost data and associated metrics (e.g., number of function points); b) create automated AIS software development and maintenance databases; c) determine what metrics drive AIS software costs; and d) develop cost estimating methodology. This effort will concentrate on developing tools for cost estimating in today's environment of 4GL, COTS, CASE tools, GUI builders, and open systems.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306  
Ms. Cheri Cummings, (703) 604-0275

**Performer:** TASC, Inc.  
4801 Stonecroft Boulevard  
Chantilly, VA 20151-3822  
(703) 633-8300  
NCCA in-house

Ms. Pamela Johnson, (703) 604-0294

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98	\$100,000	0.1	01	\$82,000	0.15
	99	\$79,000	0.1	02	\$84,000	0.15
	00	\$80,000	0.15			

**Schedule:** Start      End  
FY98      FY02

**Data Base:** AIS Software Development and Maintenance Cost/Technical Databases

**Publications:** TBD

**Categories:** II.A.1, II.A.2, II.C

**Keywords:** Government, Estimating, Demonstration/Validation, EMD, Operations and Support, Software, Statistics/Regression, Method, CER

**NCCA-26**

**Title:** Price Indices for Computers

**Summary:** This research will attempt to develop price indices for computers of different sizes such as PCs, mainframes, and Crays. First, Griliches at the National Bureau of Economic Research will review relevant literature, such as work. Data will be gathered and indices developed.

**Classification:** Unclassified

**Sponsor:** Naval Center for Cost Analysis  
1111 Jefferson Davis Highway  
Suite 400, West Tower  
Arlington, VA 22202-4306

**Performer:** Dr. Brian Flynn, (703) 604-0301  
 Naval Post Graduate School (NPGS), Monterey, CA  
 NCCA in-house  
 LCDR Ken Unger, (703) 604-0313

**Resources:** FY            Dollars            Staff-years  
 97            \$10,000            0.15  
 98            \$20,000            0.15

**Schedule:** Start            End  
 Jul 97            Jun 98

**Data Base:** Commercial computer price trends

**Publications:** TBD

**Category:** II.A.1

**Keywords:** Industry, Estimating, Production, Data Collection, Time Series, Statistics/Regression, Data Base, Method, CER

## NCCA-27

**Title:** Commodity Investment Balance Assessment (CIBA) Model

**Summary:** CIBA replaces the Dynamic Investment Balance Simulator (DIBS) described in the 1997 IDA Cost Research Symposium document (NSWCCD-7) and is a tool used to conduct Cost as an Independent Variable (CAIV) affordability determinations. Current guidance requires that the Program Manager (PM) "... plan programs consistent with the DoD Strategic Plan, and based on realistic projections of likely funding available in the FYDP and in years beyond ...." (DoD 5000-2-R Ch-3.) CIBA can be used for such applications; it can operate in an affordability mode in which future funding requirements can be determined. A separate but related macro-economic model capable of generating a range of future Navy funding streams was also developed under this effort. The foregoing DIBS model was successfully demonstrated, and previous versions of CIBA have supported a variety of studies. Proposals have been submitted for further development and enhancements. This project is related to NSWCCD-4.

**Classification:** Database: Secret; Model: Unclassified

**Sponsor:** ASN (RDA) Acquisition Reform Office  
 Michael D. Roberts, (703) 602-5506

**Performer:** Naval Surface Warfare Center, Carderock Division  
 9500 MacArthur Boulevard  
 West Bethesda, MD 20817-5700  
 Mr. Michael F. Jeffers, Jr., (301) 227-1941; DSN: 287-1941  
 Daniel Platt, (301) 227-2454, DSN: 287-2454  
 Naval Surface Warfare, Dahlgren Division  
 Dahlgren, VA 22448-5000  
 Mr. Eric Rocholl, (540) 653-5236, DSN: 249-5236  
 TASC, Inc.  
 4801 Stonecroft Blvd.  
 Chantilly, VA 20151-3559  
 Mr. Richard L. Coleman, (703) 633-8300 x4536  
 E-mail: rcoleman@ace.navy.mil

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	96	\$229,000	2.5
	98	TBD	TBD

  

<b>Schedule:</b>	<u>Start</u>	<u>End</u>	
	Sep 96	Apr 97	Closed-loop O&S capability was incorporated, torpedo and missile commodities were added
	May 97	Oct 98	Continued improvement

  

<b>Data Base:</b>	<b>Title:</b>	Navy Force Availability Model (NFAM) Data Base
	<b>Description:</b>	Model contains a force structure database derived from the SASDT and Ship Management Information System, O&S cost factors derived from VAMOSC-Ships/Air, maintained in Excel. To remain current, databases are periodically updated
	<b>Automation:</b>	Microsoft Excel Spreadsheet

  

<b>Publications:</b>	Draft reports of CIBA model and operation. Relationships documented in briefing form
<b>Category:</b>	II.A
<b>Keywords:</b>	Government, Analysis, Policy, Programming, Budgeting, Weapon Systems, Life Cycle, Acquisition Strategy, Risk/Uncertainty, Mathematical Modeling, Statistics/Regression, Mathematical Model, Computer Model

**NAVAL AIR SYSTEMS COMMAND**

<b>Name</b>	Naval Air Systems Command		
<b>Address</b>	Cost Department (AIR-4.2) 22347 Cedar Point Road, Unit 6 Patuxent River, MD 20670-1161		
<b>Director</b>	Ronald J. Rosenthal, (301) 342-2454		
<b>Size</b>	Professional:		
	NAWC-AD-LAKE:		12
	NAVAIR/NAWC-AD-PAX:		142
	NAWC-WD-CL:		15
<b>Focus</b>	<p>The Cost Department provides life cycle cost estimates, source selection cost evaluation, contractor performance measurement, cost analysis research, and cost/technical/programmatic databases for the purpose of providing a clear and comprehensive understanding of life cycle costs and attendant uncertainties to be used in developing, acquiring, and supporting affordable Naval Aviation Systems.</p> <p>Primary focus of NAVAIR cost research is as follows:</p> <p>Affordable Readiness, Total Ownership Cost, and CAIV initiatives</p> <p>Model Development e.g., Aircraft O&amp;S Costs, Propulsion O&amp;S costs, SBIR</p> <p>Life Cycle Cost, and Naval Aviation Modifications</p> <p>Database Development e.g., Production Cross Checks for Fighters and Helicopters, Aircraft Learning Curve Trends Over Time.</p> <p>Joint Strike Fighter (JSF) related studies: affordability initiatives and cost analysis/estimating technology upgrades.</p> <p>CER Development e.g., for estimating missile SE/PM costs and relating missile production unit cost to development unit cost.</p>		
<b>Activity</b>	Number of projects in process:		10
	Average duration of a project:		1.5 years
	Average number of staff members assigned to a project:		1-2
	Average number of staff-years expended per project:		1
	Percentage of effort conducted by consultants:		67%
	Percentage of effort conducted by subcontractors:		0%

## NAVAIR-1

**Title:** Joint Strike Fighter (JSF) Advanced Cost Analysis Support (Cost of Stealth)

**Summary:** Provide cost and technical support in the areas of low observability. Examine proposed and alternative technologies that can contribute to JSF low observability. Determine costs associated with specific approaches for signature control. Further develop relationships to historical low observability life cycle cost data.

**Classification:** TBD

**Sponsor:** Naval Air Systems Command (AIR-4.2.1)  
22347 Cedar Point Road, Unit 6  
Patuxent River, MD 20670-1161  
Joint Strike Fighter Program Office

**Performer:** Science Applications International Corporation (SAIC)

**Resources:** FY            Dollars            Staff-years  
97            \$180,000  
98            \$100,000

**Schedule:** Start            End  
Feb 97            Oct 98

**Data Base:** **Title:** JSF Low Observable Database  
**Description:** List of all literature collected during search  
**Automation:** Microsoft Access model

**Publications:** Study Report

**Category:** I.C.1

**Keywords:** Estimating, Analysis, Aircraft, Electronics/Avionics, Advanced Technology, EMD, Data Collection

## NAVAIR-2

**Title:** Naval Aviation Modification Model (NAMM) Data Base

**Summary:** With current military downsizing, the emphasis in acquisition has been in the area of modifications. The NAMM model allows the analyst to bound a "roughly right" modification cost estimate in a short turnaround time. The effort began in February 1994 with an analysis of the tasks to be done to accomplish the NAMM objective and an identification of the cost, technical, and programmatic data to be incorporated into the model. This was followed by: (1) data collection; (2) data review and analysis; (3) data validation and verification; and (4) the development of a Microsoft Access 2.0 Windows-based run-time model. The model was briefed at the Department of Defense Cost Analysis Symposium (DODCAS) in 1996. The model has been tested and released. Currently, there are 78 data points. Future plans are to revisit the model in 1999, to update existing data points, and to add new data points.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command (AIR-4.2A)  
22347 Cedar Point Road, Unit 6  
Patuxent River, MD 20670-1161  
Jan Young, (310) 342-2419

**Performer:** Naval Air Systems Command  
Maria Ponti, (310) 342-2307

Management Consulting & Research, Inc.  
McLean, VA

**Resources:**     FY            Dollars            Staff-years  
                    94            \$204,000  
                    95            \$100,000  
                    96            \$50,000  
                    97            \$30,000  
                    98  
                    99            \$50,000

**Schedule:**     Start            End  
                    Feb 94            Mar 97 (Phase III end)

**Data Base:**     Access 2.0

**Publications:**     Study report, user's guide

**Category:**       II.C

**Keywords:**       Government, Estimating, Aircraft, Modification, Production, Data Collection, Data Base, CER

### NAVAIR-3

**Title:**            Maintenance Trade Decision Support System

**Summary:**       Develop an automated support system to assist in the cost analyses of level and source of repair alternatives for aircraft electronics, components, engines, airframe, and weapons. The process should identify a screening mechanism to neck-down potential alternative maintenance candidates to those with the greatest cost savings potential. The tool should step a user through the pertinent cost elements to consider while identifying data sources, default values, and potential estimating relationships to utilize. Alternative maintenance concepts to be addressed include engineering change proposals (ECPs) to reduce cost by improving reliability and maintainability (R&M), changing maintenance level or depth of repair, and changing the source of maintenance. Initially based upon the NAVAIR-4.2.5 Maintenance Trade Cost Guidebook, the support system is to accommodate lessons learned in ongoing direct vendor delivery studies, commercial versus organic maintenance analyses, logistics ECP studies, and reliability improvement analyses.

**Classification:**     Unclassified

**Sponsor:**        Naval Air Systems Command (AIR-4.2.5)  
                    48110 Shaw Road Unit 5, Suite 3321  
                    Patuxent River, MD 20670-1906  
                    John A. Johnston, (301) 342-0180

**Performer:**       Ketron Division of The Bionetics Corporation

**Resources:**     FY            Dollars            Staff-years  
                    98            \$100,000            0.2

**Schedule:**     Start            End  
                    Jun 97            May 98

**Data Base:**       Direct Vendor Delivery Studies, Reliability Warranty Studies, Commercial vs. Organic Maintenance Studies

**Publications:**     TBD

**Categories:**       II.B, II.A

**Keywords:**       Government, Industry, Estimating, Analysis, Weapon Systems, Aircraft, Helicopters, Electronics/Avionics, Spares/Logistics, EMD, Production, Operations and Support, Readiness, Mathematical Modeling, Method, Computer Model



## NAVAIR-4

**Title:** Maintenance Trade Guidebook

**Summary:** Develop a Maintenance Trade Guidebook that provides a consistent and systematic approach for performing all types of maintenance trades in the new acquisition environment. The guidebook contains recommendations for screening potential candidates, provides a recommended cost structure for various categories of maintenance trades (both Acquisition and Operations and Support cost elements) which are tailored for each study. It describes data sets, points of contact and key issues for each category of cost element. In addition, it contains a potential cost methodology for use for each element to be estimated. Alternative maintenance concepts to be addressed include engineering change proposals (ECPs) to reduce cost by improving reliability and maintainability (R&M), changing maintenance level or depth of repair, and changing the source of maintenance. It incorporates lessons learned in ongoing direct vendor delivery studies, commercial versus organic maintenance analyses, logistics ECP studies, and reliability improvement analyses.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command (AIR-4.2.5)  
48110 Shaw Road Unit 5, Suite 3321  
Patuxent River, MD 20670-1906  
Mark Mutschler, (301) 342-0253, John Johnston, (301) 342-0180

**Performer:** In-house study

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$0	1.0

**Schedule:**

<u>Start</u>	<u>End</u>
Oct 96	Apr 97

**Data Base:** Direct Vendor Delivery Studies, Reliability Warranty Studies, Commercial vs. Organic Maintenance Studies

**Publications:** TBD

**Categories:** II.B, II.A

**Keywords:** Government, Industry, Estimating, Analysis, Weapon Systems, Aircraft, Helicopters, Electronics/Avionics, Spares/Logistics, EMD, Production, Operations and Support, Life Cycle, Readiness, CER, Method, Study

## NAVAIR-5

**Title:** NAVAIR Operating and Support Cost Model

**Summary:** Expand and refine the current NAVAIR aircraft O&S model to incorporate major data sets needed for program managers to implement affordable readiness, Total Ownership Cost, and CAIV initiatives. Develop an Excel spreadsheet modeling environment using Visual Basic to establish basic data entry templates, to allow integration of other electronic data inputs, and to provide a consistent and repeatable set of outputs. Besides traditional CAIG category elements and reporting, provide key information on cost drivers and their trends that impact a particular aircraft program. Provide: (1) current squadron manning for each maintenance level by work center and specialty; (2) major system reliability and maintainability trends across a several-year period; (3) a listing of all major O&S data sets and points of contact for more in-depth study; and (4) sensitivity analyses in critical areas like Depot Rework where costs are being changed by new Phased Maintenance and Reliability Centered Maintenance approaches. Publish on an annual basis the O&S costs in the new format for all major Navy T/M/S aircraft.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command (AIR-4.2.5)  
48110 Shaw Road Unit 5, Suite 3320  
Patuxent River, MD 20670-1906  
Jeff Keates, (301) 342-0251

**Performer:** In-house study

**Resources:** FY            Dollars            Staff-years  
98                \$0                0.5

**Schedule:** Start            End  
Oct 97            Sep 98

**Data Base:** Flight Hour Program Costs, Depot Rework Costs, Personnel Cost, Sustaining Support Costs, Reliability and Maintainability Cost Drivers

**Publications:** Standard Estimating Model and T/M/S Reporting

**Categories:** I.A, II.B, II.A

**Keywords:** Government, Industry, Estimating, Analysis, Weapon Systems, Aircraft, Helicopters, Electronics/Avionics, Propulsion, Airframe, Operations and Support, Readiness, Reliability, CER, Method, Computer Model

## NAVAIR-6

**Title:** SBIR Life Cycle Cost Model Development

**Summary:** Develop an automated modeling environment operating under ACEIT to develop Operations and Support and Integrated Logistics Support Estimates for Naval Aviation Systems. Develop a compendium of Naval Aviation Data Sets, expand upon existing CERs, and develop new ones when applicable that will permit the develop of consistent and repeatable estimates at the aircraft and major subsystem levels. Incorporate estimating approaches used in current NAVAIR and NCCA Operations and Support Cost Estimating. Develop an ability to do sensitivity analyses in areas like manning, impact of reliability/maintainability changes, impacts of aging fleet, and other issues that impact future costs of operation. This effort is funded under a Small Business Innovation Research Project and is in Phase II with Brennan and Associates, Inc.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command (AIR-4.2.5)  
48110 Shaw Road Unit 5, Suite 3311  
Patuxent River, MD 20670-1906  
Laurence W. Stoll, (301) 342-0239

**Performer:** Brennan and Associates, Inc.  
2614 W. Arkansas Lane, 560K  
Arlington, Texas 76016

**Resources:** FY            Dollars            Staff-years  
97-98            \$560,000            0.2

**Schedule:** Start            End  
Oct 96            Aug 98

**Data Base:** Databases to be established in Microsoft Excel Environment for O&S costs, ILS costs

**Publications:** Formal document cost study

**Categories:** I.A, II.A.1, II.A.2, II.B

**Keywords:** Government, Industry, Estimating, Analysis, Weapon Systems, Aircraft, Helicopters, Electronics/Avionics, Airframe, Propulsion, Manpower/Personnel, Spares/Logistics, EMD, Production, Operations and Support, Readiness, Mathematical Modeling, Method, Computer Model, Data Collection, Study

## NAVAIR-7

**Title:** System Engineering/Program Management Cost for Missile Development and Production

**Summary:** This study is to develop cost estimating methodologies for SE/PM for tactical missile development and production programs. The study addresses only contractor SE/PM and excludes from consideration government-incurred SE/PM cost. The database is compiled from cost history for several more recent Navy tactical missile programs and augmented with data from several older programs. A variety of analyses were performed to derive Cost Estimating Relationships (CERs) to estimate SE/PM development and production costs. This concludes Phase I effort of the study. Phase II will analyze data from a different perspective (e.g., by contractor) and develop CERs or a process for estimating SE/PM through head counts, direct charges, etc.

**Classification:** Unclassified but may contain proprietary data.

**Sponsor:** Naval Air Systems Command (AIR-4.2.3)  
22347 Cedar Point Road, Unit 6  
Patuxent River, MD 20670-1161  
Joe Cardarelli, (301) 342-2422

**Performer:** Management Consulting & Research, Inc., and SAIC both of McLean, VA

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
95	\$47,000	
96	\$75,000	

**Schedule:**

<u>Start</u>	<u>End</u>
Aug 94	April 98

**Data Base:** To be developed

**Publications:** Study report

**Category:** II.A.2

**Keywords:** Government, Industry, Estimating, Missiles, Statistics/Regression, Data Collection, Method, CER

## NAVAIR-8

**Title:** Aircraft Learning Curve Trends Over Time

**Summary:** Investigate fighter aircraft and attack aircraft manufacturing hours/pound learning curve trends from 1950 to present. Determine how the learning curve slopes have changed over time and identify possible reasons for the changes, such as, rate effects and changes in manufacturing processes.

**Classification:** Proprietary.

**Sponsor:** Naval Air Systems Command (AIR-4.2.7)  
22347 Cedar Point Road, Unit 6  
Patuxent River, MD 20670-1161  
Joe Incorvia, (301) 342-2342

**Performer:** Naval Air Systems Command (AIR-4.2.7)

**Resources:**     FY             Dollars             Staff-years  
                      98             N/A             0.25  
                      99             N/A             0.5

**Schedule:**     Start             End  
                      Oct 97             Sep 99

**Data Base:**     Title:             Historical Hours/Pound database  
                      Description:  
                      Automation:     TBD

**Publications:**     Study report

**Category:**        II.A.1

**Keywords:**        Labor, Manufacturing, Statistics/Regression, Aircraft, Government, Cost Progress Curve

## NAVAIR-9

**Title:**             Production Cross Checks for Fighter Aircraft and Helicopters

**Summary:**        Develop cross checks for each of the functional hours categories (Manufacturing, Tooling, Quality Control, Engineering) for production fighter/attack aircraft and helicopters. The cross checks will be key inputs into the process of validating and verifying cost estimates which is an essential part of the *Perform Life Cycle Cost Estimating* process. Analysts can use the cross check to determine how their estimates track with historical programs.

**Classification:**     Proprietary

**Sponsor:**        Naval Air Systems Command (AIR-4.2.7)  
                      22347 Cedar Point Road, Unit 6  
                      Patuxent River, MD 20670-1161  
                      Joe Incorvia, (301) 342-2342

**Performer:**        Naval Air Systems Command (AIR-4.2.1, 4.2.2 and 4.2.7)

**Resources:**     FY             Dollars             Staff-years  
                      98             N/A             1.5  
                      99             N/A             0.5

**Schedule:**     Start             End  
                      Oct 97             Apr 99

**Data Base:**     Title:             Fight/Attack Aircraft and Helicopter Production Cross Checks  
                      Description:  
                      Automation:     TBD

**Publications:**     Process Toolkit

**Category:**        II.A.1

**Keywords:**        Aircraft, Helicopters, Production, Manufacturing, Engineering, Government, Analysis, Labor Statistics/Regression, Data Base, Method

## NAVAIR-10

**Title:** Data for Propulsion O&S Model

**Summary:** Collect data for: (1) the mean time between removals for historically low time parts by T/M/S; (2) the percentage of engines sent to depot from IMA by T/M/S; (3) the unscheduled removal rate by T/M/S; and (4) any costs associated with (1), (2) and (3).

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command (AIR-4.2.4)  
48110 Shaw Road, Unit 5  
Patuxent River, MD 20670-1906  
Allan Pressman, (301) 342-8292; Victoria Gutierrez, (301) 979-2279

**Performer:** Ketron Division of The Bionetics Corporation

**Resources:** FY            Dollars            Staff-years  
99                \$100,000

**Schedule:** Start            End  
Oct 98            Sep 99

**Data Base:** **Title:** Propulsion O&S Data  
**Description:** Propulsion O&S Data by T/M/S  
**Automation:** O&S NAVEM Model (MS Excel)

**Publications:** Report, Data Base

**Category:** I.B.1

**Keywords:** Government, Operations and Support, Propulsion, Aircraft, Data Collection, Data Base

## NAVAIR-11

**Title:** Platform Integration Study

**Summary:** Develop Platform Integration/Installation toolkit to include definitions, data, and CER's/analyses.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command (AIR-4.2.4)  
48110 Shaw Road, Unit 5  
Patuxent River, MD 20670-1906  
Dave Volpe, (301) 342- 8275

**Performer:** TBD

**Resources:** FY            Dollars            Staff-years  
99                \$75,000

**Schedule:** Start            End  
Oct 98            Sep 99

**Data Base:** To be developed based on existing and new data

**Publications:** Report, Toolkit (users guide)

**Category:** II.A.2

**Keywords:** Government, Aircraft, Electronics/Avionics, Integration, Data Collection, Study, CER

## NAVAIR-12

**Title:** Commodity Specific Escalation Indices

**Summary:** Develop commodity (e.g., Aircraft, Weapons, Electronics) specific inflation reports to adjust historical cost information to a selected calendar base year and estimate inflation effects on these commodities in the future. These reports are based on the historical weightings of cost components (i.e., labor, material and overhead costs.) These weightings in conjunction with the Data Resource Inc. (DRI) econometric capabilities and forecasting model, provide a comparative representation of specific weapon system economic changes over time and the indication of potential future trends.

**Classification:** Proprietary

**Sponsor:** Naval Air Systems Command (AIR-4.2.7)  
22347 Cedar Point Road, Unit 6  
Patuxent River, MD 20670-1161  
Joe Incorvia, (301) 342-2307

**Performer:** Management Consulting & Research, Inc.

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$110,000	1.0

**Schedule:**

<u>Start</u>	<u>End</u>
Oct. 97	Sep 98

**Data Base:**

<b>Title:</b>	Commodity escalation indices
<b>Description:</b>	
<b>Automation:</b>	TBD

**Publication:** Commodity Specific Inflation Reports, Methodology (Process Toolkit)

**Category:** II.A.1

**Keywords:** Aircraft, Helicopters, Missiles, Electronics/Avionics, Propulsion, Labor, Material, Government, Analysis, Life Cycle, Method, Study, Data Collection, Economic Analysis

## NAVAIR-13

**Title:** Life Cycle Cost Simulation Model

**Summary:** This project has developed a system dynamics simulation model of the life cycle operations and support processes for the H-60 series helicopters. The model can be used to quantify impacts of alternative support strategies, timing and impact of technology upgrades, acquisition and retirement decisions, and design trade-off studies on cost and schedule. The simulation is not probabilistic, but driven by cause-effect relationships which age the aircraft based on factors such as usage spectrum and which could be based either on current or proposed processes. The model inputs real world maintenance data and operational behavior and is sensitive to the myriad of relationships and complex web of feedback linkages inherent in the life cycle support process. The last phase of the project will provide a cost module that will translate model results into different types of costs such as labor, materials, inventory, etc.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command (PMA-299)  
47123 Buse Rd., Unit IPT  
Patuxent River, MD 20670-1547  
Dale Rizzolo (301) 757-3095  
Navy Acquisition Center of Excellence (ACE)  
Washington Navy Yard

901 M St. SE, Bldg 22  
Washington, DC 20374  
Mr. Mike Roberts (202) 610-7000

**Performer:** Decision Dynamics, Inc.  
4600 East West Hwy.  
Bethesda, MD 20814  
Dr. Louis Alfeld, (301) 657-8500  
URL <http://www.decisiondynamics.com/>

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	Prior FY	\$52,000	
	97	\$301,000	
	98	\$390,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Dec 96	Aug 99

**Data Base:** None

**Publication:** Pending

**Category:** II.B

**Keywords:** Life Cycle, Operations and Support, Helicopters, Government, Labor, Material, Mathematical Modeling, Computer Model

## NAVAIR-14

**Title:** Estimating Avionics Program Support Costs for Engineering and Manufacturing Development Contracts

**Summary:** As part of a Cost and Operation Effectiveness Analysis (COEA) for the Joint Emitter Targeting System (JETS) a data base was developed containing Engineering and Development (EMD) costs of avionics Weapon Repairable Assemblies (WRAs) from the F/A-18 program. The data base contains development and production costs with some related programmatic information. The avionics systems contained in the data base are; AN/ALR-67(V)3, APG-73, ASPI, and IDECM. The data base was developed as a tool for estimating hardware contractor's EMD costs for the design of certain WRAs, and support costs for Prime Mission Equipment (PME) development (i.e., System Test and Evaluation, System Engineering/ Program Management, and Data). The report discusses techniques for estimating EMD support costs and contains Cost Estimating Relationships (CERs) for estimating the design efforts.

**Classification:** Unclassified

**Sponsor:** Naval Air Systems Command  
AIR-4.2.2 Cost Analysis  
Building 2185, Suite 3190  
22347 Cedar Point Road, Unit 6  
Patuxent River, MD 20670-1161

**Performer:** Mr. Tom Yochim (301) 342-0170  
MCR Federal, Inc.  
22326 Exploration Drive, Suite 102  
Lexington Park, MD 20653  
Mr. Mark Sferra, (301) 737-4600

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$36,000	

<b><i>Schedule:</i></b>	<b><i><u>Start</u></i></b>	<b><i><u>End</u></i></b>
	Jul 97	Dec 97
<b><i>Data Base:</i></b>	Contained in study subset	
<b><i>Publication:</i></b>	Study Report	
<b><i>Category:</i></b>	II.A.1	
<b><i>Keywords:</i></b>	Government, Estimating, Aircraft, Electronics/Avionics, EMD, Data Collection, Data Base, CER	



**NAVAL SEA SYSTEMS COMMAND**

<b>Name</b>	Cost Engineering and Industrial Analysis Division, Comptroller Directorate Naval Sea Systems Command	
<b>Address</b>	2531 Jefferson Davis Highway Arlington, VA 22242-5160	
<b>Director</b>	Dr. Pat Tamburrino, Jr., (703) 602-1209	
<b>Size</b>	Professional:	59
	Support:	2
	Consultants:	0
	Subcontractors:	16
<b>Focus</b>	O&S Cost Estimating; Total Ownership Cost Estimating; Commonality and Standardization of Ship Design and Construction Processes and of Ship Components or Sub-assemblies (impact on acquisition and O&S costs); Build Strategy Impact on Ship Costs; Ship Design Trade-Off Analysis Tools; Ship and Weapon System Cost Modeling	
<b>Activity</b>	Number of projects in process:	9
	Average duration of a project:	2 years
	Average number of staff members assigned to a project:	1
	Average number of staff-years expended per project:	2
	Percentage of effort conducted by consultants:	
	Percentage of effort conducted by subcontractors:	44%

## NAVSEA-1

**Title:** Private Shipbuilder Overhead Costs and Savings from Initiatives

**Summary:** The objectives of this study are to: 1) provide a better understanding of private shipbuilder overhead costs; 2) develop models to predict overhead costs at selected shipyards; 3) measure the savings associated with Sealift Technology Initiatives; and 4) assess the costs associated with excessive (acquisition) regulatory burden. Participation by private shipbuilders engaged in Navy work is sought by NAVSEA/IDA on a voluntary basis. However, data will be obtained from applicable SUPSHIP business offices and regional DCAA offices for those builders who do not care to participate.

**Classification:** Unclassified. *Proprietary* and *Business Sensitive* information will be captured and/or developed during the study but will be protected from disclosure.

**Sponsor:** OSD(PA&E), Program Analysis and Evaluation  
Pentagon, Room 2C310  
Washington, DC 20301  
Gary Bliss, (703) 695-4348  
Naval Sea Systems Command (SEA 0177)  
2531 Jefferson Davis Highway  
Arlington, VA 22242-5160  
John Bissell, (703) 602-5018; DSN: 332-5018

**Performer:** IDA  
1801 N. Beauregard Street  
Alexandria, VA 22311  
Dr. Stephen J. Balut, (703) 845-2527

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
94	\$100,000	
95	\$110,000	
96	\$110,000	
97	\$110,000	
98	\$90,000	

**Schedule:**

<u>Start</u>	<u>End</u>
Mar 94	Dec 98

**Data Base:** Database will support development and improvement of overhead cost models.

**Publications:** TBD

**Categories:** II.A.2, II.D

**Keywords:** Industry, Estimating, Ships, Overhead/Indirect, Data Collection, Mathematical Modeling, Study

## NAVSEA-2

**Title:** Shipbuilding Process Simulation Model

**Summary:** This project has developed a system dynamics simulation model of the shipbuilding process that can be used to quantify impacts on cost and schedule of ship construction delays, construction process reconfiguration, alternative build strategies, and design trade-off studies. The model is sensitive to the myriad cause-and-effect relationships and the complex web of feedback linkages inherent in the ship production process.

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 0171 and PMS 317)  
2531 Jefferson Davis Highway  
Arlington, VA 22242-5160  
Jerome Acks, (703) 602-1308, ext. 166; DSN: 332-1308

**Performer:** Decision Dynamics, Inc.  
4600 East West Hwy.  
Bethesda, MD 20814  
Dr. L. Alfred, (301) 657-8500  
URL <http://www.decisiondynamics.com/>

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
Prior FY	\$535,000	
97	\$94,000	

**Schedule:**

<u>Start</u>	<u>End</u>
Dec 94	Sep 98

**Data Base:** None

**Publications:** *Final Report: Dynamic Simulation Model of Shipbuilding Construction Delays*  
*Computer Program: ShipBuild V0.9, 15 Dec 1996*

**Category:** II.B

**Keywords:** Government, Industry, Analysis, Estimating, Ships, Labor, Material, Engineering, Manufacturing, WBS, Mathematical Model, Cost/Production Function, Computer Model

## NAVSEA-3

**Title:** Early Warning System (EWS) Integration

**Summary:** NAVSEA acquisition managers use an on-line service that allows access to contract cost/schedule performance status. Two commercially available models, Performance Analyzer (PA) and WINSIGHT, provide detailed lower level and summary levels to managers. This project will update the interface and integration between EWS, and PA and WINSIGHT. This will provide managers the flexibility to use their adopted analysis tools/models, allow the analysis results to flow to Navy management without interruption, and allow other organizations to benefit from the use of EWS.

**Classification:** Business Sensitive

**Sponsor:** Naval Sea Systems Command (SEA 0171)  
2531 Jefferson Davis Highway  
Arlington, VA 22242-5160  
Robert Meyer, (703) 602-6570; DSN: 332-6570

**Performer:** TBD

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
99	TBD	

**Schedule:**

<u>Start</u>	<u>End</u>
TBD	

**Data Base:** TBD

**Publications:** TBD

**Categories:** II.B, II.C

**Keywords:** Industry, Government, Analysis, Estimating, Review/Monitoring, Ships, Production, Labor, Material, Overhead/Indirect, Engineering, Manufacturing, WBS, Data Collection, Data Base

#### NAVSEA-4

**Title:** Material Vendor Survey

**Summary:** The objective of this annual survey is to capture future price trends and last year's actual price change for material used in Navy ship construction. The survey samples over 900 shipboard material and equipment suppliers, requesting their price changes for the current year and their projections of future price changes for the next two years. The results are grouped according to Ship Work Breakdown Structure (SWBS- Cost Groups 1-9), and indices are calculated.

**Classification:** Unclassified

**Sponsor:** Naval Sea Systems Command (SEA 0177)  
2531 Jefferson Davis Highway  
Arlington, VA 22242-5160  
John Bissell, (703) 602-5018; DSN: 332-5018

**Performer:** NAVSEA Shipbuilding Support Office (NAVSHIPSO)  
Norfolk Naval Shipyard  
Detachment, Code 2900  
Philadelphia, PA 19112-5087  
Bob Laarkamp

**Resources:** FY      Dollars      Staff-years  
Each year      \$125,000

**Schedule:** Start      End  
Oct each year      Sep each year

**Data Base:** End use is MATCER Data File update. Backup data is maintained at NAVSHIPSO.

**Publications:** None

**Category:** II.A.1

**Keywords:** Industry, Estimating, Ships, Material, WBS, Economic Analysis, Survey

#### NAVSEA-5

**Title:** AACEI Cost Model for Aircraft Carriers

**Summary:** The objective is to update the ASSET ACEIT EXCEL Interface (AACEI) cost modeling process and tailor it for use to estimate the end cost of ship alternatives under study by the Carrier program office(s). A weight-based cost model formulated within the Automated Cost Estimating Integrated Tools (ACEIT) was developed under previous tasks (Sealift, SC21). Weight information for a ship designed in ASSET is electronically transferred by the ASSET user to the ACEIT cost model where the cost of the ASSET ship design is generated at the two or three digit level of detail. This process is consistent with the SEA 017 Unit Price Analysis and End Cost methodology and provides immediate insight into the cost impact of design changes. For the cost analyst, design engineer, and decision makers, this provides the ability to compare alternatives and better understand the cost consequences of design options. It also provides the ability to identify where effort should be focused (areas of maximum cost impact) and sort the data to rank order cost drivers by

1, 2 and 3-digit levels of the SWBS. Automated graphical and tabular presentations allow both cost and engineering analysts to identify anomalies in the cost and the technical characteristics of each alternative and more readily identify inadvertent errors in the technical or cost inputs. Proposed work will expand the model to incorporate a present value analysis technique (compatible with other such PV modeling of the carrier office projects) and continue the development of aircraft carrier CERs and estimating factors to capture differences from the source CERs to the technologies and ship features under consideration; expand to cover other elements of the ship end cost, e.g., GFE, Escalation and Plans; develop additional automated, tailored graphical and tabular reports; and conduct preliminary work to implement the integration of O&S estimating and other improved estimating techniques and tools (i.e., Performance Based Cost Modeling and PODAC); and add functionality to ACE to improve efficiency in the Navy environment.

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 01712)  
2531 Jefferson Davis Highway  
Arlington, VA 22242-5160

Irv Chewning/Steve Moretto/Robin Hull, (703) 413-4913/4935

**Performer:** Tecolote Research, Inc.  
1700 N. Moore Street, Suite 1400  
Rosslyn Center Office Building  
Arlington, VA 22209

Alfred Smith, (703) 243-2800, ext. 335

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	Prior FY	\$350,000	
	98	\$450,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 98	Oct 99

**Data Base:** Carriers

**Publications:**

**Category:** II.A

**Keywords:** Government, Analysis, Review, Ships, Concept Development, Labor, Material, Overhead/Indirect, Engineering, Acquisition Strategy, Data Collection, Mathematical Modeling, CER, Method, Mathematical Model, Study

## NAVSEA-6

**Title:** SEA 0177 Shipyard Workload Model Improvements

**Summary:** The objective is to document existing network software operating systems that make up the shipyard workload model, and correct and implement solutions to a number of problems requiring an immediate fix.

**Classification:** Unclassified. *Proprietary* and *Business Sensitive* information will be captured and/or developed during the study but will be protected from disclosure.

**Sponsor:** Naval Sea Systems Command (SEA 01)  
2531 Jefferson Davis Highway  
Arlington, VA. 22242-5160  
Robert Storey, (703) 602-3538

**Performer:** Naval Sea Systems Command (SEA 0177)  
 2531 Jefferson Davis Highway  
 Arlington, VA 22242-5160  
 John Bissell, (703) 602-5018  
 AAC Associates, Inc.  
 2361 Jefferson Davis Highway  
 Heitman Center ML 108  
 Arlington, VA. 22202  
 Surendra Gupta, (703) 415-4400

**Resources:** FY            Dollars            Staff-years  
 97            \$65,535

**Schedule:** Start            End  
 3 Apr 97            30 Sep 97

**Data Base:** Database will support Shipyard Workload Model improvements.

**Publications:** None

**Category:** II.A.2

**Keywords:** Industry, Analysis, Ships, Production, Acquisition Strategy, Cost/Production Function, Computer Model

## NAVSEA-7

**Title:** COTS Electronic Technology Assessment/Refresh Cost Model

**Summary:** Development of a cost model as an element of an overall process for COTS planning and budgeting. The cost model is intended to support decision making on COTS upgrades and technology refreshes driven by rapid COTS product cycles, availability, reliability, and supportability. The primary use of the model is to optimize out-year support costs for electronic systems by performing cost tradeoffs of viable solutions for near and long-term support problems of COTS based electronic systems. The output of the cost model provides life cycle support costs with respect to fiscal years and is intended to be used as a planning and budgeting tool.

**Classification:** Unclassified

**Sponsor:** Naval Sea Systems Command (PMS 411)  
 2531 Jefferson Davis Highway  
 Arlington, VA 22242-5160  
 CAPT Richard Goldsby, (703) 602-5064  
 Naval Surface Warfare Center, Crane Division  
 Sustainable Hardware and Affordable Readiness Practices (SHARP) Program  
 Crane, IN 47522  
 Mike Grubb, (812) 854-5089

**Performer:** Naval Surface Warfare Center, Crane Division  
 Code 602  
 Crane, IN 47522  
 Mike Roby, (812) 854-2406

**Resources:** FY            Dollars            Staff-years  
 96            \$50,000  
 97            \$260,000

**Schedule:**      Start              End  
                          Jul 96              Sep 97

**Data Base:**      None

**Publications:**    Technology Assessment Guidebook

**Categories:**      I.B, I.C

**Keywords:**        Government, Estimating, Programming, Budgeting, Electronics/Avionics, Life Cycle, Modification, Sustainability, Engineering, WBS, Data Collection, Survey, Mathematical Modeling, Computer Model

## NAVSEA-8

**Title:**              Total Ownership Cost Reduction Process and Templates

**Summary:**        This project is aimed at developing a process for reducing the Total Ownership Cost (TOC) of Navy program. TOC is defined as all costs associated with the research, development, procurement, operation, logistical support and disposal of an individual weapon system including the total supporting infrastructure that plans, manages and executes that weapon system program over its full life. TOC includes the cost of requirements for common support items and systems that are incurred because of introduction of that weapon system. It excludes indirect "non-linked" Navy and DoD infrastructure costs that are not affected by individual weapon systems' development, introduction, deployment or operations. NAVSEA, in cooperation with NAVAIR, is developing the process. In addition to the process, the project will develop tools necessary for implementation. These will include standard templates and a database for documenting and tracking TOC Reduction Plans and cost savings.

**Classification:**    Unclassified

**Sponsor:**        Naval Sea System Command (SEA 017)  
                          2531 Jefferson Davis Highway  
                          Arlington, VA 22242-5160  
                          Pat Tamburrino, (703) 602-1209, ext. 169; DSN: 332-1209  
                          Naval Air Systems Command (AIR 4.2)  
                          Naval Air Station, Patuxent River, Maryland  
                          Ron Rosenthal, (301) 342-2454

**Performer:**        Naval Sea System Command (SEA 0171)  
                          2531 Jefferson Davis Highway  
                          Arlington, VA 22242-5160  
                          Robert Meyer, (703) 602-6570, ext. 165; DSN: 332-6570

**Resources:**        FY              Dollars              Staff-years  
                          98              \$250,000              2  
                          99              TBD

**Schedule:**        Start              End  
                          Dec 97              Jun 99

**Data Base:**        Under development

**Publications:**    web site: <http://www.navsea.navy.mil/sea017/toc.htm>

**Category:**        II.C



**Keywords:** Government, Analysis, Estimating, Review/Monitoring; Weapon Systems, Aircraft, Ships, Land Vehicles, Electronic/Avionics, Facilities, Infrastructure; Life Cycle; WBS, Fixed Costs, Variable Costs, Readiness, Modification; Data Collection, Economic Analysis; Data Base, Method, Computer Model.

## NAVSEA-9

**Title:** Government Furnished Equipment/ Materiel (GFE/GFM) Process Improvement Initiative.

**Summary:** This project initiative is intended to develop a self-serving database with WEB interface that the NAVSEA community can use to generate, analyze, and estimate the costs of GFE/GFM used on the various ship platforms designed and acquired by the Naval Sea Systems Command.

**Classification:** Business Sensitive

**Sponsor:** Naval Sea System Command (SEA 0171B)  
2531 Jefferson Davis Highway  
Arlington, VA 22242-5160  
Lorraine Andriani, (703) 602-1679, ext. 159; DSN: 332-1679

**Performer:** TBD

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$250,000	
99	TBD	

**Schedule:**

<u>Start</u>	<u>End</u>
May 98	Jan 99

**Data Base:** TBD

**Publications:** None to date

**Category:** II.B

**Keywords:** Government, Industry, Analysis, Estimating, Ships, Budgeting, Acquisition Strategy, Production, Data Base, Computer Model

**NAVAL SURFACE WARFARE CENTER, DAHLGREN DIVISION**

<b>Name</b>	Cost/Affordability Branch Naval Surface Warfare Center, Dahlgren		
<b>Address</b>	Code T50 (Warfare Analysis Division) Dahlgren, VA 22448-5000		
<b>Director</b>	Amanda Cardiel		
<b>Size</b>	Professional:	9	
	Support:	0	
	Consultants:	0	
	Subcontractors:	As required	
<b>Focus</b>	<p>The Cost/Affordability Branch resides within the Warfare Analysis and Systems Department at the Naval Surface Warfare Center, Dahlgren Division (NSWCDD). The Office has NSWCDD responsibility for providing leadership in the areas of Cost and Operational Effectiveness Analysis (COEA) for Surface Navy Combat Systems and Theater Tactical Ballistic Missile Defense (TBMD). Particular areas of expertise and emphasis include developing and maintaining models, databases, and procedures for performing these functions, technology assessments, life cycle cost estimates, budget and force-level analyses, performance-based cost models, and product-oriented cost models.</p> <p>The current focus of the NSWCDD cost research program is: models to generate cost estimates for complex surface navy combat system equipment and TBMD ordnance during concept formulation and DemVal phases of a program; data collection in preparation for model development to estimate life cycle software maintenance workload during the concept formulation and DemVal phases; performance-based methods for estimating life cycle cost; implementing Cost as an Independent Variable and for analyzing total ownership cost.</p>		
<b>Activity</b>	Number of projects in process:	3	
	Average duration of a project:	2 years	
	Average number of staff members assigned to a project:	—	
	Average number of staff-years expended per project:	—	
	Percentage of effort conducted by consultants:	—	
	Percentage of effort conducted by subcontractors:	—	

**NSWCDD-1**

**Title:** TBMD Missile Model

**Summary:** This effort is directed towards the development of a model to estimate the various missile designs in the TBMD COEA. The missile cost model is a workbook spreadsheet that operates in Microsoft Excel. This model is complex in that it integrates a number of cost models and individual CERs. Missile subsystem costs are estimated by cost models operating at the assembly level or by CERs estimating total subsystem costs. New CERs have been developed for some of the missile subsystems during this COEA.

**Classification:** Unclassified (Proprietary)

**Sponsor:** Naval Surface Warfare Center (Code T51)  
Dahlgren Division  
Dahlgren, Virginia 22448-5000

**Performer:** Naval Surface Warfare Center (Code T51)  
Dahlgren Division (Combat Systems and Cost Model Integration)  
Dahlgren, Virginia 22448-5000

Ted Towles, (540) 653-7369; Amanda Cardiel

Technomics, Inc.

5290 Overpass Road, Suite 206

Santa Barbara, CA 93111

Eugene Waller, (805) 964-9894; Chris Brown

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	Prior FY	\$180,000	
	96	\$20,000	
	97	\$20,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Feb 95	Sep 97

**Data Base:** Data used to create the models and CERs were from various Army and Navy development and production programs that were deemed to be relevant to current technology missiles. There are two-seeker hardware cost models resident in the missile cost model, one for infrared and one for RF seekers. These two models are composed of a number of assembly-level CERs. The missile cost model includes CERs for rocket motors, divert/attitude control systems, target detectors, inertial measurement units, GPSs, control sections, wings and fins, batteries, data links, and integration. Besides hardware costs, CERs are used to estimate non-recurring development, development support, and procurement support. All models and CERs were developed between 1992 and 1995.

**Publications:** TBD

**Category:** II.C

**Keywords:** Government, Estimating, Missiles, EMD, Test and Evaluation, Production, Statistics/Regression, Mathematical Model

**NSWCDD-2**

**Title:** RDT&E Development Support CERs for Radar Programs

**Summary:** Using hardware costs as input variables in CERs have been used in the past as a method of estimating below the line costs. One problem with this approach becomes evident with estimating the costs of new radars, which are comprised of hundreds of replicating

components. There is no logical reason why the below the line costs should scale with the hardware costs in this situation. Awareness of this problem led the Naval Surface Weapons Center/Dahlgren Division to request that Technomics examine and develop CERs, if feasible, using the radar RDT&E database available in MCR Report TR-8740-2, *Electro-Optical, Missile, Radar And Avionics System Cost Research: Cost Analysis Techniques Report: Volume 4: Electronic Systems RDT&E Cost Model*.

**Classification:** Unclassified

**Sponsor:** Naval Surface Warfare Center (Code T51)  
Dahlgren Division  
Dahlgren, Virginia 22448-5000  
John Kozicki, (540) 653-8308

**Performer:** Technomics, Inc.  
5290 Overpass Road, Suite 206  
Santa Barbara, CA 93111

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98	\$5,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 97	Feb 98

**Data Base:** Stated Above

**Publications:** *Development Support CERs For Radar Program*, TR-9601-03

**Category:** II.C

**Keywords:** Government, Estimating, Weapons Systems, Ships, Electronics/Avionics, Mathematical Modeling, CER

**NAVAL SURFACE WARFARE CENTER, CARDEROCK DIVISION**

<b>Name</b>	Cost and Operational Effectiveness Assessments Department, Code 21 Cost and Economic Analysis Group, Code 211 Naval Surface Warfare Center, Carderock Division	
<b>Address</b>	9500 MacArthur Boulevard West Bethesda, MD 20817-5000	
<b>Director</b>	Robert R. Jones	
<b>Size</b>	Professional:	8
	Support:	3
	Consultants:	0
	Subcontractors:	3
<b>Focus</b>		
<b>Activity</b>	Number of projects in progress:	10
	Average duration of a project:	2
	Average number of staff members assigned to a project:	2
	Average number of staff-years expended per project:	4
	Percentage of effort conducted by consultants:	0
	Percentage of effort conducted by subcontractors:	20%

**Title:** Cost Module for Sealift Ship Version of ASSET

**Summary:** The objective is to update the cost module of the ASSET ship design synthesis model and tailor it for use in assessing technology developments for sealift ships for the Mid-Term Sealift Ship Technology Development Program (MTSSTDP). The approach taken is to develop an electronic interface to transfer information between ASSET and a cost model formulated within the Automated Cost Estimating Integrated Tools (ACEIT). Technical information is produced in ASSET and electronically transferred by the ASSET user to ACEIT, which automatically estimates the cost of the ship; the cost estimate is then automatically transferred back to ASSET to provide near-immediate cost feedback to design engineers as they use ASSET. Early effort focused on basic construction cost estimates. Current work expands upon this and adds life cycle costing capability.

**Classification:** Unclassified

**Sponsor:** Naval Sea System Command (SEA 01712)  
2531 Jefferson Davis Highway  
Arlington, VA 22242-5160

Jerome Acks, (703) 602-1308; DSN: 332-1308

**Performer:** Carderock Division, Naval Surface Warfare Center (Code 21)  
9500 MacArthur Boulevard  
West Bethesda, MD 20817-5700

C. F. Snyder, (301) 227-5479; DSN: 287-5479  
Chris Whitacre, (301) 227-3003; DSN: 287-3003

Tecolote Research, Inc.  
1700 N. Moore Street, Suite 1400  
Rosslyn Center Office Building  
Arlington, VA 22209

Alfred Smith, (703) 243-2800

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	Prior FY	\$220,000	
	96	\$60,000	
	97	\$150,000	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Feb 94	Sep 97

**Data Base:** None

**Publications:** *MTSSTDP Ship Construction Cost Model - Training & User's Guide (vol. 1)*  
*MTSSTDP Ship Construction Cost Model - Appendices (vol. 2)*  
*MTSSTDP Ship Construction Cost Model and Cargo Ship Assessment Model (CSAM)*

**Category:** II.A.2

**Keywords:** Government, Analysis, Review, Ships, Concept Development, Labor, Material, Overhead/Indirect, Engineering, Acquisition Strategy, Data Collection, Mathematical Modeling, CER, Method, Mathematical Model, Study



**Title:** Product-Oriented Design and Construction (PODAC) Cost Model

**Summary:** This cost model will incorporate a Product Work Breakdown Structure and be sensitive to changes in shipbuilding strategies, ship construction process, use of common modules, zonal architectures, and equipment standardization. It will assist in assessment of the cost and affordability of design commonality alternatives that have potential for reducing acquisition and ownership costs of ships in conjunction with the NAVSEA Affordability Through Commonality (ATC) Program and the Mid-Term Sealift Ship Technology Development Program (MTSSTD). Concept exploration phase was completed with selection of a baseline from conceptual models developed by cost research projects—Development of Product-Oriented Cost Estimating Tools and Near-Term Prototype PODAC model. The prototype is currently being installed and implemented, by an integrated product team composed of Navy, shipyard personnel, and model developers, at the five surface shipyards and at NAVSEA. Partial functionality of the model was demonstrated in February 1997. Cost model validation testing is being performed at the shipyards. The focus of the cost model development was redirected to primarily support engineering tradeoff studies. FY 98 efforts include model validation, model demonstration through tradeoff studies and model capability expansion into the life cycle cost area.

**Classification:** Unclassified

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Designers & Planners, Inc.; SPAR, Inc.; University of Michigan Transportation Research Institute; Avondale Shipbuilding, Inc.; Bath Iron Work, Inc.; Ingalls Shipbuilding, Inc.; National Steel and Shipbuilding Company; and Newport News Shipbuilding

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
Prior FY	\$295,000		98	\$800,000	
96	\$990,000		99	\$800,000	
97	\$862,000				

**Schedule:**

<u>Start</u>	<u>End</u>	
Sep 94	Sep 95	Concept Exploration
Oct 95	Feb 97	Prototype Dem/Evaluation
Apr 97	Apr 98	Model Installation/Implementation at shipyards
Apr 98	Mar 00	Life Cycle Cost Capability

**Data Base:** Resident within cost model

**Publications:** *Production-Oriented Design and Construction (PODAC) Cost Model Plan of Action and Milestones and Functional Specification (FY 96)*  
*Cost Estimating Relationships Development Plan (1997)*  
*PODAC Cost Model Validation Plan (1997)*  
*Product-Oriented Design and Construction Cost Model (1998)*

**Categories:** II.A.2, II.B  
**Keywords:** Government, Estimating, Ships, Production, Labor, Material, Overhead/Indirect, Engineering, Manufacturing, WBS, Case Study, Survey, Cost/Production Function, Method, Mathematical Model, Study

## NSWCCD-3

**Title:** Surface Combatant Performance-Based Life Cycle Cost Model (PBCM)

**Summary:** The objective was to develop a cost model sensitive to high-level performance parameters for predicting the Life Cycle Cost (LCC) of major surface combatants. The resulting model is envisioned as a tool to provide quick ROM cost estimates of surface combatant ship concepts during the Cost Operational Effectiveness Analysis (COEA) process, or to investigate the cost implications of alternative mission requirements prior to Milestone II. Phase I of the effort, the development of a pre-prototype cost model, is complete. Phase I Deliverables included a POA&M, Project Definition Report, and pre-prototype model. Phase II is also complete, having developed a production model complete with a survivability module and documentation of the algorithms. Phase III will extend the capabilities of the model, focusing on RDT&E, Operating and Support costs, and production modeling. These and other features will be incorporated into the model during FY98 if needed to support the DD21 program. Note that the Surface Combatant PBCM is largely integrated with the Aircraft Carrier PBCM, supporting the CVX program.

**Classification:** Classified/Business Sensitive

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<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
Prior FY		\$100,000		97	\$50,000	
96		\$120,000		98	\$0	

**Schedule:** Start End  
 Jun 93 Sep 97

**Data Base:** TBD

**Publications:** Project Definition Report, Algorithms Report

**Categories:** II.A.2, II.D

**Keywords:** Government, Estimating, Analysis, Electronics/Avionics, Concept Development, Demonstration/Validation, Labor, Material, Overhead/Indirect, Data Collection, Statistics/Regression, CER, Data Base, Method, Computer Model

**Title:** Navy Force Affordability Model (NFAM)

**Summary:** This model replaces the previous NFAM and the Dynamic Investment Balance Simulator (DIBS). It relates future Navy force structures and budgets. It has two principal modes of operation. The first, derived from previous versions of NFAM, calculates budgets based on the user's input of force structure plans, including retirements and new procurements. The second, derived from DIBS, uses a goal-seeking algorithm to determine force structures based on the user's input of budgets. A third, hybrid, mode combines these capabilities, so that force structure decisions may be specified for some systems and not for others. In all modes, the model tracks force structure decisions and funding needs at the SASDT category level as well as the ship class or aircraft type/model/series (T/M/S) level. In the goal-seeking mode, the model allows examination of tradeoffs between acquisition (future force structure) and O&S (maintaining current force structure) in a range of funding environments. The model is also capable of exploring more explicit tradeoffs within limited acquisition categories. The procurement decision algorithm strives to maintain the 'shape' of the force (relative numbers of various platform types) in the event that budgets are inadequate to meet the stated goals. A separate but related macroeconomic model capable of generating a range of future Navy funding streams was also developed under this effort. The DIBS model has been successfully demonstrated (FY93), and previous versions of NFAM have supported a variety of studies. Proposals have been submitted for further development and enhancements. NCCA-27 is related to this project.

**Classification:** Database—Secret; Model—Unclassified

**Sponsor:** Chief Naval Operations (Code N812)  
The Pentagon  
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<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
Prior FY		\$390,000	2.5	97	\$0	0
96		\$0	0	98	\$50,000	0.3

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
Feb 93		TBD
Nov 93		DIBS Prototype
Apr 95		DIBS Enhancements
Sep 95		New Relationships, Excel 5.0 (both NFAM and DIBS)
Mar 98		New NFAM, combines old NFAM and DIBS

**Data Base:** *Title:* NFAM Data Base  
*Description:* Model contains a force structure database derived from the SASDT and Ship Management Information System, O&S cost factors derived from VAMOSC-Ships/Air, maintained in Excel. To remain current, databases are periodically updated.  
*Automation:* Microsoft Excel Spreadsheet  
**Publications:** Draft reports of DIBS model and operation. Relationships documented in briefing form.  
**Category:** II.A  
**Keywords:** Government, Analysis, Policy, Programming, Budgeting, Weapon Systems, Life Cycle, Acquisition Strategy, Risk/Uncertainty, Mathematical Modeling, Statistics/Regression, Mathematical Model, Computer Model

## NSWCCD-5

**Title:** Nuclear Attack Submarine Technology-Based Parametric Cost Model  
**Summary:** The objective of this project was to develop a technology-driven life cycle cost model for nuclear attack submarines. The model provides feedback on how a technology (or group of technologies) affects total life cycle cost based upon engineering judgement of performance, weight and cost impacts. Using the previously developed nuclear attack submarine, performance-based parametric cost model, this project integrated the performance-based analysis with 6.2 Submarine Technology analysis of component-level technology goals. The resulting model is a tool for providing quick ROM cost estimates of submarine system concepts that include new technology options. The FY96 version of this model was limited to structural systems technologies and their effect on procurement cost. The model development plan called for the ability to assess the life cycle cost effects of technologies related to structural systems, signature control, maneuvering and seakeeping, and power and automation. No funding was received in FY97 to complete development of the model.

**Classification:** Business Sensitive

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Marc Greenberg, (301) 227-4716; DSN: 287-4716; Robert R. Jones; Dr. Stuart Ullman

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	96	\$150,000	1
	97	\$0	0

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Apr 96	Sep 97

**Data Base:** *Title:* None  
*Description:* Historical summary of the technical characteristics of nuclear attack submarine structural systems  
*Automation:* Microsoft Excel Spreadsheet

**Publications:** *Development of the Submarine Technology Assessment Cost Model (SUBTACM), CARDEROCKDIV NSWCCD/TSS-97-015, September 1997*

**Category:** II.B

**Keywords:** Government, Analysis, Ships, Concept Development, Life Cycle, Manufacturing, Advanced Technology, Risk/Uncertainty, Size, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Mathematical Model, Computer Model

## NSWCCD-6

**Title:** Analysis of Operation and Support (O&S) Costs for Aircraft Carriers

**Summary:** The objective of the project is to evaluate Organizational and Intermediate aircraft carrier O&S cost data and develop cost estimating relationships that will support costs estimates required for the acquisition and design of aircraft carriers. The data and resulting analysis will be used to assist the design community in trade-off studies of technology. The study will improve understanding of the composition of aircraft carrier O&S costs. The analysis will identify cost drivers (with the ability to rank order the drivers by 1, 2, and 3-digit levels of the SWBS), develop cost estimating relationships, and improve methodologies for estimating costs by compiling and documenting statistical or engineering models. FY 99 efforts will aim at expanding the O&S modeling to reflect changes in future maintenance planning, e.g., proposed life cycle plans, and work towards achieving aircraft carrier Total Ownership Cost reduction goals. The work will be coordinated with the program office execution plan for CAIV and TOC metrics. The work will support the CVX FY 99 Milestone I review and the ship requirements definition process.

**Classification:** Business Sensitive

**Sponsor:** Naval Sea Systems Command (SEA 01712)  
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Steve Moretto, (703) 413-4913/4950

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<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98	\$600,000	4
	99	\$600,000	4

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 98	Oct 99

**Data Base:** The data base will consist of Intermediate, Organizational and Depot-Level Aircraft Carrier O&S cost data organized at the 1, 2, 3 and selected 4 and 5-digit levels of the Expanded Ship Work Breakdown Structure (ESWBS).

**Publications:** None

**Categories:** II.A.1, II.A.2, II.B, II.C, II.D

**Keywords:** Government, Estimating, Analysis, Ships, Production, Labor, Operations and Support, Statistics/Regression, Study, CER

**Title:** Aircraft Carrier Performance-Based Life Cycle Cost Model and Present Value Analysis Modeling

**Summary:** The Carrier performance-based life cycle cost model (PBCM) is being developed in an evolutionary fashion. The FY 98 effort focused on a "pre-prototype" or screening version of the model that estimates procurement costs based on high-level descriptors of (a) performance requirements and (b) system definition. This pre-prototype model served as an initial proof of concept design to assess the feasibility of proceeding to more comprehensive and detailed PBCM. FY99 efforts will concentrate on successful completion and acceptance of the pre-prototype procurement model then expanding the model to estimate the entire life cycle cost impact of a performance feature, i.e., R&D and operating and support, and disposal costs. The model will be used for the CVX Requirements definition process and development of estimates in support of the planned FY 99 Milestone I review. The PBLCCM will aim to: (1) facilitate the development of cost estimates which address the application of technological improvements in the ship design, (2) provide quick ROM cost estimates of aircraft carrier design options, and (3) to investigate the cost implications of survivability enhancements.

The Present Value Analysis Modeling (Cost Benefit Analysis Model) will provide a common analysis technique for assessing the benefits versus costs of design improvements and technology application or insertion for aircraft carrier programs. The FY 98 effort focused on modeling the entire life cycle to provide a total ownership cost perspective. The FY 99 effort will expand the technique for assessment of individual technology impacts or individual design option impacts. The analysis will include estimates of the life cycle costs for all ships of the Nimitz Class including the CVN 77 and the planned CVX class of carriers. The model overlays CVX life cycle costs on the Nimitz profile for various affordability scenarios. The cash flow analysis can reflect user-specified acquisition requirements. Cash flows may be represented by the total life cycle cost or one or more of the five major life cycle cost elements: Manpower, Maintenance, Production, Mid-life Overhaul and Disposal. The cost benefit model can be used to illustrate the life cycle cost scenarios of CVX as compared to a baseline Nimitz Class ship to enable affordability assessments. The model performs cost-benefit analyses, e.g. investment vs. net present value savings estimates, by estimating discounted "cost avoidance" of the more affordable CVX design against the discounted investment outlays required to achieve "cost avoidance." The current model provides a top-down perspective of carrier life cycle cost categories, cost drivers and cost objectives. FY 99 effort will expand the model to better reflect program objectives, e.g. RDT&E proposed in the current POM NALG, proposed life cycle profiles for future carrier maintenance, requirements determination process in development of the IRD/ORD, design and acquisition strategy trade-off studies, etc.

Both of the above tools will be utilized as tools to assist in the CAIV and TOC metrics analysis for carrier programs.

**Classification:** Classified/Business Sensitive

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Christine Whitacre; Dan Platt; Kim Howard

**Resources:**     FY                Dollars                Staff-years  
                    97                \$65,000                0.5  
                    98                \$470,000               3.0

**Schedule:**     Start                End  
                    Dec 96                Sep 97  
                    Dec 97                Dec 98

**Data Base:**     Title:                None  
                    Description:       Aircraft carrier, LHA, and LHD cost, weight, and performance  
                    Automation:       Microsoft Excel Spreadsheet

**Publications:**   None to date

**Category:**       II.B

**Keywords:**       Government, Analysis, Ships, Concept Development, Life Cycle, Manufacturing,  
Risk/Uncertainty, Size, Data Collection, Mathematical Modeling, Statistics/Regression,  
Data Base, Mathematical Model, Computer Model

#### NSWCCD-8

**Title:**                Arsenal Ship Operating and Support Cost Model

**Summary:**        As part of the source selection support effort, an operating and support cost model was developed. This model was intended to be sensitive to particular Arsenal Ship issues such as reduced manning levels and maintenance concepts outside standard Navy procedures. Effort on this model ceased in FY97.

**Classification:**   Business Sensitive

**Sponsor:**        Arsenal Ship Joint Project Office  
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Arlington, VA  
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**Performer:**       Carderock Division, Naval Surface Warfare Center (Code 21)  
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Michael F. Jeffers, (301) 227-1941; DSN: 287-1941; Christine Whitacre; Robert R. Jones

**Resources:**     FY                Dollars                Staff-years  
                    97                \$225,000               1.5

**Schedule:**     Start                End  
                    Sep 96                Oct 97

**Data Base:**     Title:                None  
                    Description:       Operating and support cost  
                    Automation:       Microsoft Excel Spreadsheet

**Publications:**   None to date

**Category:**       II.B

**Keywords:** Industry, Government, Analysis, Ships, Operations and Support, Training, Readiness, Reliability, Sustainability, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Mathematical Model, Computer Model

## NSWCCD-9

**Title:** Aircraft Carrier Cost-Benefit Analysis Model

**Summary:** The effort will gather ship cost data on CVX development efforts and determine the ROI on the total ownership cost for numerous system level concepts at various levels of the Aircraft Carrier work break-down structure.

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<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98	\$570,000	3.0
	99	\$500,000	3.5

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Dec 98	Dec 99

<b>Data Base:</b>	<b>Title:</b>	None
	<b>Description:</b>	Current SEA017 Aircraft carrier life cycle cost estimates
	<b>Automation:</b>	Microsoft Excel Spreadsheet

**Publications:** None to date

**Category:** II.B

**Keywords:** Government, Analysis, Ships, Concept Development, Life Cycle, Manufacturing, Risk/Uncertainty, Size, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Mathematical Model, Computer Model



**Title:** USCG Performance-Based Life Cycle Cost Model

**Summary:** The objective is to develop a cost model sensitive to high-level performance parameters for predicting the Life Cycle Cost (LCC) of U.S. Coast Guard (USCG) ship designs. The resulting model is envisioned as a tool to provide quick ROM cost estimates of USCG ship concepts, including icebreakers, high endurance cutters, and medium endurance cutters, during the early stages of ship concept development. This effort is scheduled for completion by the end of FY98.

**Classification:** Unclassified

**Sponsor:** United States Coast Guard Engineering Logistics Center (ELC023)  
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LCDR Michel J. Guerard, (301) 227-3627

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$104,100	0.70

**Schedule:**

<u>Start</u>	<u>End</u>
Mar 98	Dec 98

**Data Base:**

<b>Title:</b>	None
<b>Description:</b>	Cost information for USCG icebreakers, high endurance cutters, medium endurance cutters, and for U.S. Navy oceanographic ships
<b>Automation:</b>	None

**Publications:**

**Categories:** II.A.2, II.D

**Keywords:** Government, Estimating, Analysis, Electronics/Avionics, Concept Development, Demonstration/Validation, Labor, Material, Overhead/Indirect, Data Collection, Statistics/Regression, CER, Data Base, Method, Computer Model

**AIR FORCE COST ANALYSIS AGENCY**

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<b>Director</b>	Mr. Joseph T. Kammerer, (703) 697-5312		
<b>Size</b>	Professional:	63 (authorized); 51 (assigned)	
	Support:	2	
	Consultants:	—	
	Subcontractors:	—	
<b>Focus</b>			
<b>Activity</b>	Number of projects in process:	9	
	Average duration of a project:	1 year	
	Average number of staff members assigned to a project:	1	
	Average number of staff-years expended per project:	0.2	
	Percentage of effort conducted by consultants:	75%	
	Percentage of effort conducted by subcontractors:	0%	

**AFCAA-1**

**Title:** NAFCOM

**Summary:** The project develops and integrates specific AF requirements into the database and NASA Cost Model. The incorporation of AF requirements allows data and cost estimates to be displayed, analyzed, and used in a manner compatible with AF terminology and costing procedures. Phase II includes incorporating Air Force specific cost drivers into the Complexity Generator development process. Phase III will incorporate phasing, risk analysis, and further generation of complexity factors from Phase II. A Phase IV is anticipated.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
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**Performer:** SAIC

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
Phase I	96	\$150,000	
Phase II	97	\$150,000	
Phase III	98	\$150,000	
Phase IV	99	TBD	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
Phase I		Complete
Phase II		Complete
Phase III	Nov 97	Nov 98
Phase IV	Nov 98	Nov 99

**Data Base:** NAFCOM Database

**Publications:** Normalized Database and NAFCOM Documentation

**Category:** II.A.2

**Keywords:** Government, Estimating, Space Systems, Analysis, Life Cycle, Spares/Logistics, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression, CER, Computer Model

**AFCAA-2**

**Title:** Crosslinks Payload Data Collection and CER Development

**Summary:** This project involves the data collection on crosslink payloads and the development of cost estimating relationships (CERs). Data collection will involve the collection of past and current crosslinks. The data collected will be consistent with the NASA/AF standard WBS and standard normalization procedures. It will provide the database to develop CERs and cost estimating crosschecks.

**Classification:** TBD

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
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**Performer:** TBD

**Resources:** FY      Dollars      Staff-years  
                  99            TBD

**Schedule:**    Start            End  
                  Oct 98            Oct 99

**Data Base:**    TBD

**Publications:** TBD

**Category:**    II.A.2

**Keywords:**    Government, Estimating, Analysis, Spares/Logistics, Life Cycle, Data Collection, Data Base, Mathematical Modeling, Statistics/Regression

### AFCAA-3

**Title:**            Missiles ACDB Update

**Summary:**      The objective of this project is to collect the necessary data to perform periodic updates of the Automated Cost Data Base (ACDB) to include 665 CCDR reports on missile programs. These updates require a second phase to conclude data entry and additional new reports.

**Classification:** Unclassified

**Sponsor:**       Air Force Cost Analysis Agency, Research Division  
                  Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394  
                  E-mail: obrien@af.pentagon.mil

**Performer:**      Tecolote Research, Inc.

**Resources:**            FY            Dollars            Staff-years  
                  Phase I        97            \$165,000  
                  Phase II       98            \$100,000  
                  Phase III      99            TBD

**Schedule:**            Start            End  
                  Phase I        May 97        Apr 98  
                  Phase II       Apr 98        Oct 98  
                  Phase III      Oct 98        Oct 99

**Data Base:**        *Title:* Missile Automated Cost Data Base (ACDB)  
                  *Description:* Missiles and Munitions systems data  
                  *Automation:* PC in FoxPro

**Publications:**    TBD

**Category:**        II.A.1

**Keywords:**        Government, Analysis, Programming, Forces, Mathematical Modeling, Computer Model, Life Cycle, Labor, Material, Data Collection, Data Base, Missiles

### AFCAA-4

**Title:**            Below-the-Line Cost Study for Missiles and Munitions

**Summary:**        This project involves a comprehensive effort to update the below-the-line cost research study completed by Tecolote in 1994. Although the study as it stands now has been useful, the most recent cost data is from 1990. The effort will involve retrieving the most

recent cost data points from the ACDB Tri Service Missile and Munitions database and performing analysis to update and add new CERs to the original study. This effort will include narratives of the CER development including graphs and summary statistics as well as detailed spreadsheets with raw and normalized data. In addition during the course of analysis, if any new below the line costs are discovered that are not in ACDB then these data points would then be added to the missile database.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
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**Performer:** Tecolote Research Inc.

**Resources:** FY            Dollars            Staff-years  
99            TBD

**Schedule:** Start            End  
Oct 98            Oct 99

**Data Base:** TBD

**Publications:** Updated final report showing all relevant analysis and CERs

**Category:** II.A.2

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Missiles, Life Cycle, Training, Data Collection, CER, Data Base

## AFCAA-5

**Title:** Weapon System Cost Growth Study

**Summary:** This in-house research project is currently taking a look at updating the weapon system cost growth study conducted by SAF/FMC in 1989. This study will not only look at aircraft systems but will include missile system cost growth at each milestone. The principle means to conduct this effort has been through analysis of historical SAR reports by examining the cost growth for the 100<sup>th</sup> unit for aircraft and the 1000<sup>th</sup> unit for missiles. Analysis is also being conducted to see if there is a relationship between development time and unit cost including flying hour costs. This analysis portion is anticipated for Phase II. The final briefing will include narratives explaining some of the reasons for the cost growth in each of the systems.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
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**Performer:** Phase I: Air Force Cost Analysis Agency  
Phase II: TBD

**Resources:** FY            Dollars            Staff-years  
Phase I: 98            In-House  
Phase II: 99            TBD

**Schedule:** Start            End  
Phase I: Jan 98            Oct 98  
Phase II: Oct 98            Oct 99

**Data Base:** Excel files

**Publications:** Final briefing report showing summary of analysis  
**Category:** II.A.2  
**Keywords:** Government, Estimating, Analysis, Weapon Systems, Aircraft, Missiles, EMD, Production, Life Cycle, Manufacturing, Schedule, Labor, Material, Overhead/Indirect, Data Collection, CER, Data Base

## AFCAA-6

**Title:** Below-the-Line In-House Cost Research Study  
**Summary:** This in-house research project is currently taking a look at collecting below the line costs including SEPM, Data, Training, STE etc for aircraft systems, launch complex activation, and airborne radar. The aircraft portion of the study includes top level summaries by all aircraft types as well as factors by platform type including fighters, bombers, trainers, and cargo transport aircraft. This study will be unique in that it not only breaks out below-the-line costs by EMD and Production but it also examines factors by production lot. This analysis will include detailed spreadsheets and show both raw and normalized data.  
**Classification:** Unclassified  
**Sponsor:** Air Force Cost Analysis Agency, Research Division  
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128  
E-mail: plumer@af.pentagon.mil  
**Performer:** Air Force Cost Analysis Agency  
**Resources:** FY            Dollars            Staff-years  
98  
**Schedule:** Start            End  
Sep 97            Aug 98  
**Data Base:** TBD  
**Publications:** Summary report and spreadsheets showing analysis completed  
**Category:** II.A.2  
**Keywords:** Government, Estimating, Analysis, Weapon Systems, Aircraft, Missiles, Space Systems, EMD, Production, Life Cycle, Manufacturing, Schedule, Labor, Material, Overhead/Indirect, Data Collection, CER, Data Base

## AFCAA-7

**Title:** Multi-Aircraft Database Normalization  
**Summary:** The objective of this project is to normalize and fully document previously collected Air Force and Navy cost and technical data. The database will be flexible enough to allow for either an analogy-based or CER-based approach for both recurring and non-recurring costs of aircraft systems. The database will contain functional hourly and cost information as well as technical information for each hardware WBS element. Sources of data and normalization rationale will be completely documented. This project is a continuation of a research effort undertaken with FY 93 funds.  
**Classification:** Unclassified  
**Sponsor:** Air Force Cost Analysis Agency, Research Division  
Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394  
E-mail: obrien@af.pentagon.mil

**Performer:** Phase I RAND  
Phase II Tecolote Research Inc.  
Phase III Naval Air Systems Command

**Resources:**

	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
Phase I	93	\$100,000	
Phase II	96	\$225,000	
Phase III	97	\$25,000	

**Schedule:**

	<u>Start</u>	<u>End</u>
Phase I	Complete	
Phase II	Complete	
Phase III	Apr 98	Oct 98

**Data Base:** TBD

**Publications:** TBD

**Categories:** I.B, I.D, II.A, II.B

**Keywords:** Government, Analysis, Estimating, Aircraft, Airframe, EMD, Production, Labor, Material, Data Collection, Data Base

## AFCAA-8

**Title:** Price H Composite Material Calibration

**Summary:** This project will develop normalized Price H calibrations for aircraft composite fabrication processes and techniques. This calibration will be based on actual manufacturing data and experience. The effort will analyze and calibrate different composite materials and processes such as hand lay-up or machine lay-up techniques across different contractors. The final product will include narrative of the information collected as well as actual and normalized cost data with a user friendly means to calibrate the Price H model for the various input parameter settings.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128  
E-mail: plumer@af.pentagon.mil

**Performer:** Price

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
99	TBD	

**Schedule:**

<u>Start</u>	<u>End</u>
Oct 98	Oct 99

**Data Base:** TBD

**Publications:** Summary report and Price H Calibration results

**Category:** II.A.2

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Aircraft, EMD, Production, Life Cycle, Manufacturing, Labor, Material, Advanced Technology, Data Collection, CER, Data Base, Mathematical Modeling



**AFCAA-9**

**Title:** Aircraft Database Study Follow-On

**Summary:** Collect, analyze, and organize historical cost data for the following aeronautical programs B-2 and C-5 .

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394  
E-mail: obrien@af.pentagon.mil

**Performer:** Tecolote Research Inc.

**Resources:** FY            Dollars            Staff-years

**Schedule:** Start            End  
Oct 98            Oct 99

**Data Base:** TBD

**Publications:** TBD

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Life Cycle, Data Collection, Mathematical Modeling, Statistics/Regression, CER, Data Base, Computer Model

**AFCAA-10**

**Title:** Avionics Systems Data Collection

**Summary:** The objective of this effort is to update/develop a historical avionics database to allow analysts to better understand and apply the data during subsequent cost estimating relationship (CER) development. Cost, technical, and programmatic data from the population of U.S. military weapons with on-board avionics systems, including those with integrated avionics architecture (vice federated) will be collected. The data will be validated and normalized. Sources of data, validation efforts, and normalization rationale will be completely documented.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128  
E-mail: plumer@af.pentagon.mil

**Performer:** TBD

**Resources:** FY            Dollars            Staff-years  
99            TBD

**Schedule:** Start            End  
Oct 98            Oct 99

**Data Base:** TBD

**Publications:** TBD

**Categories:** I.B.1, I.C.1, II.B

**Keywords:** Government, Analysis, Electronics/Avionics, EMD, Production, Labor, Material, Data Collection, Data Base

**AFCAA-11**

**Title:** Overhead Study

**Summary:** The objective of this project is to provide a primer discussing methods of measuring and predicting business base changes for a prime weapon system contractor; then describing how to calculate alternate overhead rates given different assumptions of that contractor's future business base. This effort will allow normalization of current WRAP rates to the historical data underlying an estimate; it will also allow normalization of the historical cost data to reflect current WRAP rate calculations. Phase II will include additional contractor sites.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394  
E-mail: obrien@af.pentagon.mil

**Performer:** Naval Air Systems Command

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
Phase I	97	\$160,000	
Phase II	98	TBD	

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
Phase I	Oct 97	Oct 98
Phase II	Oct 98	Oct 99

**Data Base:** Excel

**Publications:** Stand-alone documentation on each contractor site.

**Categories:** I.B, II.A, II.B

**Keywords:** Government, Analysis, Estimating, Aircraft, Production, Labor, Material, Data Collection, Data Base

**AFCAA-12**

**Title:** Long Range Planning O&S Cost Models

**Summary:** This project will fulfill a tasking from SAF/FM to provide top-level system cost modeling in support of AF/XOX and the Air Force Corporate Structure to develop a database of operations and support models that an analyst can use to swiftly model current and future force structure alternatives. These O&S models will be built in Excel and provide a rough-order-of-magnitude modeling of O&S costs for the majority of Air Force weapon systems in the inventory as well as many futuristic systems. The completed database will allow the analyst to rapidly produce a series of ROM cost estimates based on the force structure scenarios the customer provides.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128  
E-mail: plumer@af.pentagon.mil

**Performer:** TASC

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98	\$150,000	

**Schedule:**      Start              End  
                      Jan 97              Sep 98

**Data Base:**      Excel Spreadsheets

**Publications:**      Summary report and O&S spreadsheets showing analysis completed

**Category:**        II.A.2

**Keywords:**        Government, Estimating, Analysis, Weapon Systems, Aircraft, Missiles, Space Systems, EMD, Production, Life Cycle, Data Collection, CER, Data Base

## AFCAA-13

**Title:**              Integrated Force and Infrastructure Cost Model (IFICM)

**Summary:**        IFICM is an organizationally-based simulation of the total Air Force structure. It will be designed to provide decision-makers insight into how changes in force and basing structure will effect support and infrastructure costs. This model takes a unique approach estimating support and infrastructure costs by modeling the Air Force base structure at wing level. Wing and squadron level cost and manpower requirements, by PE and appropriation, are estimated from CER and planning factors unique to the weapon system based at each location. Requirements are accumulated through the various organizational levels to a total AF TOA roll-up with links to supporting infrastructure organizations such as logistics, training, and recruiting which generate other related costs and capacity metrics. The model output is intended to be used in mid- and long-range planning exercises in support of MAP, QDR, DPP, and BRAC type initiatives.

**Classification:**      Unclassified

**Sponsor:**        Air Force Cost Analysis Agency, Research Division  
                      Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128  
                      E-mail: plumer@af.pentagon.mil

**Performer:**        TBD

**Resources:**        FY              Dollars              Staff-years  
                      99              TBD

**Schedule:**                      Start              End  
                      Phase I              Oct 98              Oct 99  
                      Phase II              Oct 99              Oct 00

**Data Base:**        TBD

**Publications:**      TBD

**Categories:**        II.B, II.C

**Keywords:**        Government, Analysis, Forces, Infrastructure, Acquisition Strategy, Automation, Data Collection, Method

## AFCAA-14

**Title:**              Force Analysis Decision Support System ACEIT Enhancements

**Summary:**        The objective of this effort is to provide enhancements to ACEIT to facilitate Force Costing and budget analysis. This effort will provide a general-purpose framework for combining weapon system cost estimates at a summary level into an integrated budget analysis utility. This framework will support top level yearly budget drills and will assist with analysis of alternative Force mixes. In addition, it will enhance the utility of ACEIT

by improving the integration of ACEIT with other Windows applications. Enhancements will be made to the ACEIT Executive to provide more flexibility with using ACE sessions from within Excel. To the extent funding is available, other specific enhancements will be made to CO\$TAT and ACE.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
Mr. Eric Plumer, (703) 602-9128; DSN: 332-9128  
E-mail: plumer@af.pentagon.mil

**Performer:** Tecolote

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$190,000	

**Schedule:**

<u>Start</u>	<u>End</u>
May98	May99

**Data Base:** Product updates shall be included in scheduled ACEIT releases to ensure proper integration between multiple ACEIT development efforts and to reduce distribution expenses.

**Publications:** Updates to User's Guides may be distributed in electronic or paper format, as required.

**Category:** II.A.2

**Keywords:** Industry, Government, Estimating, Analysis, Weapon Systems, Life Cycle, Method, Computer Model

## AFCAA-15

**Title:** Air Force Total Ownership Cost (AFTOC)

**Summary:** AFTOC is projected to expand upon the Visibility and Management of Operating and Support Costs (VAMOSC) database. Phase I of this effort focuses on having direct costs for aircraft systems only on-line by Apr 98. It also includes the addition of selected Space and Missile Systems along with aircraft component level data by Jul 98. Finally, Phase I will add aircraft indirect cost by Sep 98. Phase II involves the addition of costs for the remaining Space, Missile, AIS, and C4I Systems.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency, Force Analysis Division  
Ms Wendy Kunc, (703) 604-0415; DSN: 664-0415  
E-mail: kuncw@af.pentagon.mil

**Performer:** TASC and Battelle

**Resources:**

	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
Phase I	98	\$425,000	
Phase II	99	\$490,000	

**Schedule:**

	<u>Start</u>	<u>End</u>
Phase I	Dec 97	Sep 98
Phase II	Oct 98	Sep 99

**Data Base:** TBD

**Publications:** TBD

**Categories:** II.A.2, II.C

**Keywords:** Government, Reviewing/Monitoring, Aircraft, Space Systems, Missiles, Operations and Support, Labor, Material, Data Collection, Data Base

## AFCAA-16

**Title:** ACEIT Upgrades / RISK Integration

**Summary:** Update of ACEIT cost estimating software to improve cost estimate accuracy and cost estimator productivity. Our mission is to perform cost estimates in support of weapon system major milestone decisions. This tool enables our agency to prepare and document our cost estimates more effectively. This project specifically upgrades the Windows version of ACEIT and improves phasing, speed, documentation, COSTAT statistics, and the incorporation of the RISK module into ACEIT. Follow-on efforts are yet to be determined.

**Classification:** Unclassified.

**Sponsor:** Air Force Cost Analysis Agency, Research Division  
Ms. Theresa O'Brien, (703) 604-0394; DSN: 664-0394  
E-mail: obrien@af.pentagon.mil

**Performer:** Tecolote Research, Inc.

**Resources:**

	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
Past Improvements:	93-5	\$646,000	
Current Improvements:	96-7	\$410,000	
Follow on Efforts:	99	TBD	

**Schedule:**

	<u>Start</u>	<u>End</u>
Current Improvements:	Jan 97	Sep 98
Follow on Efforts:	Oct 98	Oct 99

**Data Base:** N/A

**Publications:** ACE IT user manuals and supporting documentation

**Categories:** II.A.2, II.B

**Keywords:** Industry, Government, Estimating, Analysis, Weapon Systems, Life Cycle, Method, Computer Model

**AERONAUTICAL SYSTEMS CENTER,  
AIR FORCE MATERIEL COMMAND**

<b>Name</b>	Aeronautical Systems Center, Air Force Material Command Cost Division, Comptroller Directorate	
<b>Address</b>	ASC/FMC Bldg. 14, Rm. 152 1865 4 <sup>th</sup> Street Wright-Patterson AFB, OH 45433-7123	
<b>Director</b>	Ms. Kathy A. Ruffner, (937) 255-6483	
<b>Size</b>	Professional:	38
	Support:	4
	Consultants:	0
	Subcontractors:	0
<b>Focus</b>	Cost Estimating and Research, Resources Analysis (Source Selection Policy and Estimates) Scheduling, Earned Value Management and Performance Measurement, Integrated Risk Management, and Support of Analysis of Alternatives.	
<b>Activity</b>	Number of projects in process:	6
	Average duration of a project:	Varies
	Average number of staff members assigned to a project:	1
	Average number of staff-years expended per project:	.33
	Percentage of effort conducted by consultants:	—
	Percentage of effort conducted by subcontractors:	66%

## ASC/FMC-1

**Title:** Advanced Aircraft Cost Forecasting Model (AACFM)

**Summary:** This model primarily estimates life cycle costs in an early system environment. It is similar to PRICE in estimating systems and major subsystems. However, it includes unique O&S and risk cost modeling features. The database is currently unclassified, but it is easy to populate with classified data by the end user. The model includes a published paper, briefing, and a user's guide. AACFM is hosted in Microsoft Access 2.0 and runs on Windows 3.1. The model requires at least a 486 personal computer with at least 8 megabytes of random access memory (RAM) to run efficiently.

**Classification:** Unclassified

**Sponsor:** ASC/XRPC  
Mr. Patrick Cyrus, (937) 255-6262

**Performer:** Ms. Helen Scratt  
President Econ, Inc.  
18685 Main Street (A401)  
Huntington Beach, CA 92648  
Phone: (714) 596-9938  
Fax: (714) 596-9249  
Email: Econwest@AOL.COM  
  
Mr. Robert Phillips  
Vice-President Econ, Inc.  
711 West Bay Area Blvd.  
Webster, TX 77598  
Phone: (281) 554-7592  
Fax: (281) 554-4481  
Email: Econwest@AOL.COM

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98-00	\$745,542	0
	(Phase IIA&B)	

**Schedule:**

<u>Start</u>	<u>End</u>
Jan 94	Jan 96

**Data Base:**

System Level: Program go-ahead data, First Flight date, Year of Initial Operating Capability (IOC), Number of Test Aircraft, Number of Production Aircraft, State of the Art, Base Complexity, Complexity Growth, Calculated Complexity, Weight Specification or Operating Environment, Integration Factors (EMD, Production), Base year.

Hardware Level: Number of engines per aircraft, Aircraft empty weight, Subsystem state-of-art rating, Subsystem operating environment, 100th unit cost.

Software Level: Software Complexity, Software function, Percent new design, Number of lines of code, Software certification level, Operating environment, Composite hourly rate for labor.

Integration: Development integration complexity, Production integration complexity.

**Publications:** Draft user manual and briefing

**Category:** II.B

**Keywords:** Government, Estimating, Electronics/Avionics, Weapon Systems, Life Cycle, Engineering, Manufacturing, Mathematical Modeling



**ASC/FMC-2**

**Title:** Automated Model for Integrating Cost with Operational Effectiveness

**Summary:** This Phase 2 contractual effort is to create a PC based tool to integrate cost and operational effectiveness analysis. The model uses optimal technique algorithms to determine outcome and cost as force mix is changed. PHASE 2 focuses on four primary activities—developing linkage models for BRAWLER and other engineering/engagement models in use by ASC/XR. Optimization algorithms will be integrated with BRAWLER, cost models and linkage models to allow new designs to be specified to maximize performance for a given cost. Existing cost models will be augmented with an aircraft integration model and a modified operating and support model. Software will be developed to interface a PC with the user for cost presentations and for optimization input/output.

**Classification:** Unclassified

**Sponsor:** ASC/XRPC  
Mr. Patrick Cyrus, (937) 255-6262

**Performer:** Technomics, Inc. (Prime)  
5290 Overpass Road, Suite 206  
Santa Barbara, CA 93111  
Mr. Eugene Waller  
Mr. John Horak, (805) 964-9894  
Toyon Research Corporation (Subcontractor)  
75 Aero Camino, Suite A  
Goleta, CA 93117-3139  
Mr. Mark T. Fennell, (805) 968-6787 ext. 158

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98-00(Prime)	\$441,470	0
(Sub)	<u>\$275,002</u>	
	\$716,472	

**Schedule:**

<u>Start</u>	<u>End</u>
Aug 97	Aug 99

**Data Base:** System LEVEL: Number of test aircraft, number of production aircraft, and first flight data.  
Hardware LEVEL: A/C unit weight, material complexity, supersonic or subsonic, maximum engine thrust, turbine inlet temperature  
Software LEVEL: Source lines of code, Source lines of reused code, SW Language, Labor Rate, Specific application or types of application  
Aircraft Integration: Types of platform, Installed weight, Removed weight, Type of modification, # of Cables

**Publications:** Software disc & documentation, user manual, final report and briefing

**Category:** II.B

**Keywords:** Government, Estimating, Electronics/Avionics, Weapon Systems, Life Cycle, Engineering, Manufacturing, Mathematical Modeling

**ASC/FMC-3**

**Title:** PRICE Model Calibration Studies

**Summary:** The F-15 System Program Office is sponsoring PRICE Model calibration efforts for their program. The F-15 study will look at aircraft integration associated with various modification efforts in support of enhancing the use of the PRICE H and PRICE S model.

**Classification:** Unclassified

**Sponsor:** ASC/FMCE  
Mr. Scott DeBanto, (937) 656-5483

**Performer:** Lockheed Martin PRICE SYSTEMS

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98	\$79,930	0

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Nov 97	Oct 98

**Data Base:** **Title:** PRICE Model Aircraft Calibration Database  
**Description:** F-15 Data  
**Automation:** Access

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Aircraft, EMD, Production, Engineering, Manufacturing, Integration, Modification, Data Collection, Computer Model

**ASC/FMC-4**

**Title:** Integrated Desktop Analysis and Planning System (IDAPS) Concept Evaluation (ICE)

**Summary:** The Integrated Desktop Analysis and Planning System (IDAPS) Concept Evaluation (ICE) system was sponsored by ASC/XR and created by Frontier Technology, Inc. It is an integrated environment that is a concept cost analysis tool that enables concept evaluation and total system life-cycle cost analysis. The system does this by integrating approved cost models, CORE, DLR and SEER. Incorporation of additional models is being worked. (Note that to use current ICE, one needs access to SEER-SEM version 4.6.8 and SEER-H version 3.7.6 software licenses.) Minimal PC requirements are a 486 or higher platform running Windows 3.1.1, Windows 95 or Windows NT operating systems.

**Classification:** Unclassified

**Sponsor:** ASC/XRI  
Mr. Bert Turner, (937) 255-3164, ext. 3016

**Performer:** Frontier Technology, Inc.  
4141 Col Glenn Highway, Suite 140  
Beavercreek, OH 45431  
Phone: (937) 429-3302, ext. 22  
E-mail: rshroder@fti-net.com

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
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**Schedule:** Status is Complete

**Publications:** Training Manual Documentation is available

**Category:** II.A

**Keywords:** Government, Analysis, Life Cycle, Computer Model

**ASC/FMC-5**

**Title:** Case Study, APG-63 V(1) Radar, F-15

**Summary:** The objective of this study is to examine the entire APG-63 (V)1 program and identify benefits attributable to acquisition reform and other initiatives. There is substantial interest in quantifiable cost reduction realized through Acquisition Reform, but corroborating empirical evidence is scarce. Information collected during this research effort will be provided to IDA for potential inclusion in their on-going research to assess cost reduction initiatives. The APG-63 (V)1 radar program has been managed under the new acquisition environment and has completed Engineering & Manufacturing Development (EMD) within performance, schedule, and budget. The program entered Low Rate Initial Production (LRIP) in Aug 97.

**Classification:** Unclassified/Proprietary Information

**Sponsor:** ASC/FMCE  
Wright-Patterson AFB, OH 45433-7123  
Ms. Kathy Watern, (937) 656-5491

**Performer:** ASC/FMCE  
Ms. Janet Wentworth, (937) 656-5484

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
		.33

**Schedule:**

<u>Start</u>	<u>End</u>
Apr 98	Nov 98

**Data Base:** F-15 Development Support Office (DSO) APG-63 program files, ASC Cost & Schedule Data Center program cost estimates and cost performance reports, and contractor's programmatic records.

**Publications:** TBD

**Categories:** I.A, I.B.1

**Keywords:** Government, Industry, Estimating, Analysis, Aircraft, Electronics/Avionics, Demonstration/Validation, EMD, Acquisition Strategy, Modification, Data Collection, Case Study, Review, Study

**ASC/FMC-6**

<b>Title:</b>	Avionics Support Cost Factors Update
<b>Summary:</b>	This project is a comparison and analysis of avionics support cost factors developed in a 1988 study and current 1998 factors. These support factors include Primary Mission Equipment (PME), Systems Engineering/Program Management (SE/PM), System Test and Evaluation, Support Equipment, Data, and Training.
<b>Classification:</b>	Unclassified
<b>Sponsor:</b>	ASC/FMCE Wright Patterson Air Force Base, OH Ms. Kathy Watern, (937) 656-5491
<b>Performer:</b>	ASC/FMCE Mr. Don Wren, (937) 656-5496

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**AIR FORCE SPACE AND MISSILE SYSTEM CENTER**

<b>Name</b>	Air Force Space and Missile System Center Cost Division	
<b>Address</b>	2430 E. El Segundo Blvd., Suite 2010 Los Angeles AFB, CA 90245-4687	
<b>Director</b>	Mr. Anthony E. Finefield	
<b>Size</b>	Professional:	13
	Support:	1 (Aerospace)
	Consultants:	0
	Subcontractors:	2 (EER Systems, MCR Federal)
<b>Focus</b>		
<b>Activity</b>	Number of projects in process:	5
	Average duration of a project:	1 year
	Average number of staff members assigned to a project:	1
	Average number of staff-years expended per project:	0.3
	Percentage of effort conducted by consultants:	0
	Percentage of effort conducted by subcontractors:	99%

## AFSMC-1

**Title:** Hazardous Materials Disposal Cost Study

**Summary:** The OSD Cost Analysis Improvement Group (CAIG) is requiring all programs to include the costs of disposing of hazardous waste in their program life cycle cost estimates. Few programs have included these costs in their estimates and some do not include all of the costs. This is the fourth part of a study to define the types and magnitude of costs related to hazardous waste disposal, determine what part of the life cycle will be impacted by these costs, and provide samples/examples of program life cycle cost estimates and trade studies. This task will consist of modifying the developed handbook and training program with changes requested by AFMC to incorporate all AFMC product center information to make this a command handbook.

**Classification:** Unclassified

**Sponsor:** SMC/FMC

**Performer:** EER Systems, Inc.  
Ms. Mary Helen Alverio, (310) 363-2882

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
prior	\$226,094	0.6
97-98	\$415,000	0.4

**Schedule:**

<u>Start</u>	<u>End</u>
Mar 97	Apr 98

**Data Base:** Handbook of cost methodologies for estimating the cost of environmental mitigation strategies, hazardous material cleanup, and planning for use of non-hazardous materials.

**Publications:** *Space and Missile Systems Center Environmental, Safety and Health Management and Cost Handbook*

**Categories:** I.D, II.D

**Keywords:** Government, Estimating, Weapon Systems, Space Systems, Aircraft, Data Collection, Life Cycle, Missiles, Environment, Method, Study

## AFSMC-2

**Title:** Operating and Support (O&S) Database

**Summary:** Populate fields of database and modify automated stand-alone tool to work in windows. Database contains data that can be used for analogy estimates, calibration efforts, and CER development, and is compatible with current Air Force computer systems.

**Classification:** Unclassified

**Sponsor:** SMC/FMC

**Performer:** MCR Federal, Inc.  
Ms. Shirley Tinkler, (310) 363-5057

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
prior	\$1,086,000	0.5
98	\$70,000	0.1

**Schedule:**

<u>Start</u>	<u>End</u>
Apr 98	Apr 99

**Data Base:** Title: SMC Operating and Support (O&S) Database

**Description:** Contains cost and technical data for O&S ground systems, remote tracking systems, and launch systems

**Automation:** Access

**Publications:** SMC O&S Database Final Report (Phase 4), OSDB User's Manual, Space and Missile Systems Center/FMC

**Categories:** II.A.1, II.A.2

**Keywords:** Government, Estimating, Space Systems, Operations and Support, WBS, Data Base, Size, Data Collection

### AFSMC-3

**Title:** Passive Sensor Cost Model Update

**Summary:** The methods for estimating space sensor payloads (passive sensors, e.g., infrared) need to be updated. Subsystems reviewed were: focal plane arrays; optical telescope assemblies; cryogenic coolers; servo electronics; gimbals and structures; star sensors; power supplies; and sensor integration, assembly and test.

**Classification:** Unclassified (Proprietary database separately bound)

**Sponsor:** SMC/FMC

**Performer:** EER Systems, Inc.  
Aerospace Corporation  
Ms. Phu Nguyen, (310) 363-0071

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
prior	\$780,000	0.8
98	\$100,000	0.1

**Schedule:**

<u>Start</u>	<u>End</u>
Aug 98	Aug 99

**Data Base:**

**Title:** Sensor Database

**Description:** Contains cost and technical and programmatic data by WBS at the sensor subsystem level.

**Automation:** EXCEL and Access

**Publications:** Passive Sensor Cost Model, (1997) Space and Missile Systems Center/FMC

**Category:** II.A.2

**Keywords:** Government, Estimating, EMD, Space Systems, Production, WBS, CER, Statistics/Regression, Data Base, Method, Data Collection, Survey, Electronics/Avionics

### AFSMC-4

**Title:** Software Database

**Summary:** Maintained the SMC Software Database by adding new data. Modified automated stand-alone tool to work in windows. Normalized missing parameters. DoD's largest software database.

**Classification:** Unclassified (Proprietary and Non-Proprietary Versions)

**Sponsor:** SMC/FMC

**Performer:** MCR Federal, Inc.



Ms. Shirley Tinkler, (310) 363-5057

**Resources:**     FY            Dollars            Staff-years  
prior            \$961,000            0.7  
98               \$ 70,000            0.1

**Schedule:**     Start            End  
Apr 98           Apr 99

**Data Base:**     **Title:**            SMC Software Database  
**Description:**     Contains schedule, sizing, effort, and maintenance data from space, ground, mobile, and airborne platforms.  
**Automation:**     Access

**Publications:**   *SMC Software Database FY96 Data Collection Effort Final Report SWDB User's Manual*, Space and Missile Systems Center/FMC

**Categories:**     II.A.1, II.A.2

**Keywords:**       Government, Estimating, Space Systems, WBS, Data Base, EMD, Size, Data Collection, Production, Modification

## AFSMC-5

**Title:**             Unmanned Spacecraft Cost Model (USCM) Update

**Summary:**       Update the 7th edition (1994) of the model with developing, validating, documenting new CERs, and obtaining new data points.

**Classification:**   Unclassified (Proprietary database separately bound)

**Sponsor:**        SMC/FMC

**Performer:**       Aerospace Corporation  
Tecolote Research, Inc.

Ms. Phu Nguyen, (310) 363-0071

**Resources:**     FY            Dollars            Staff-years  
prior            \$1,649,000            1.1  
98               \$ 120,000            0.1

**Schedule:**     Start            End  
Aug 98           Aug 99

**Data Base:**     **Title:**            USMC Database  
**Description:**     Includes cost, technical, and programmatic data by WBS at the spacecraft component level.  
**Automation:**     The database is contained in Excel spreadsheets and Automated Cost Data Base (ACDB)

**Publications:**   *Unmanned Spacecraft Cost Model*, 7th edition, Space and Missile Systems Center/FMC

**Categories:**     II.A.2, II.B

**Keywords:**       Government, Estimating, EMD, Space Systems, Production, WBS, CER, Mathematical Modeling, Statistics/Regression, Data Base, Method, Mathematical Model

**ELECTRONIC SYSTEMS CENTER,  
AIR FORCE MATERIEL COMMAND**

<b>Name</b>	Air Force Materiel Command Cost Training & Tools, Cost Division, Electronic Systems Center	
<b>Address</b>	5 Eglin Street Hanscom AFB, MA 01731-2117	
<b>Director</b>	Ms. Ellen Coakley, (781) 377-5226	
<b>Chief</b>	Mrs. Margaret Weech, (781) 377-3919	
<b>Size</b>	Professional:	3
	Support:	2
	Consultants:	0
	Subcontractors:	0
<b>Focus</b>	Development and fielding of cost estimating tools and databases for C <sup>2</sup> systems. Responsible for searching out and reviewing the latest C <sup>2</sup> cost and schedule estimating tools available from other government agencies and commercial sources and evaluating for potential use at ESC. Providing timely, quality cost estimating training to ESC analysts and assuring they are up-to-date on new methodologies, tools, estimating approaches and policies.	
<b>Activity</b>	Number of projects in process:	—
	Average duration of a project:	—
	Average number of staff members assigned to a project:	—
	Average number of staff-years expended per project:	—
	Percentage of effort conducted by consultants:	—
	Percentage of effort conducted by subcontractors:	—

## ESC/FMC-1

**Title:** Labor Analysis Process & Automated for Estimating & Proposal Evaluation

**Summary:** This process and tool assesses skill-levels and the ability of an offeror to attract and retain labor. This process and tool is also used to identify appropriate skill-mixes and the associated labor rates for each skill. It can be used for both IDIQ and non-IDIQ type contracts and A-76 studies. The source data comes from periodic Bureau of Labor Statistics (BLS) salary surveys, (or another similar benchmark) which include specific Labor Category Definitions and associated Direct Labor Rates. Model includes Direct Labor Rates per hour for Engineers, Computer Programmers, Computer System Analysts, Computer System Analysts Supervisor/Manager, and Engineering Technicians by geographical area. Direct labor rates for many other categories such as base support type activities are also available. This process and automated tool assesses the realism of proposed labor by identifying unrealistically low or high proposed rates. It also assesses the offeror's ability to attract and retain required labor -- "Can the contractor realistically expect to provide the bid labor for the price offered?" Used in reverse it is also very powerful -- If rate equates to skill-level 'X', is this skill level adequate to accomplish the job, based on inputs from appropriate functional specialists such as engineers, etc. The associated automated tool is easy to use, identifies what percentage of the benchmark's population was above and below any specific labor rate, and also automatically outputs some briefing charts.

**Classification:** Unclassified

**Sponsor:** ESC/FMC

**Performer:** ESC/FMC  
Ellen Coakley with Support from Tecolote Research, Inc.

**Resources:** FY      Dollars      Staff-years

**Schedule:** Fielded

**Data Base:** (BLS rates are updated regularly)

**Publications:**

**Category:** II.B

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Manpower/Personnel, Labor, Survey, Computer Model

## ESC/FMC-2

**Title:** Use of Automated Cost Estimator-Integrated Tools (ACE-IT) for Cost Proposal Evaluation and the Storage of Cost/Schedule/Technical Data

**Summary:** Automated Cost Estimator-Integrated Tools (ACE-IT) can be used as an analysis tool to evaluate Cost Proposals. The Cost Proposal data would be loaded into ACE-IT's Automated Cost Data Base (ACDB) from computer disk or by electronic transfer and then analyzed in CO\$TAT (the statistics module) with the resulting trends and analyses stored in the ACE Knowledge Base. In addition to using ACE for proposal evaluation of the instant contract, ACE-IT would be used to store proposal data for all offerors and to develop trend factors and algorithms by contractor.

**Classification:** Unclassified

**Sponsor:** ESC/FMC

**Performer:** ESC/FMC, ESC/FMCT

Tecolote Research, Inc.

**Resources:** FY Dollars Staff-years

**Schedule:** Start End

May 96

**Data Base:** **Title:**

**Description:** Data from Cost Proposals

**Automation:** PC ACE-IT Windows ACE/COSTAT/ACDB

**Publications:**

**Category:** II.B

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Data Collection, Data Base

### ESC/FMC-3

**Title:** Industry/Government C<sup>2</sup> Cost Working Group

**Summary:** ESC/FMC is in the process of organizing a government/industry C<sup>2</sup> Working Group. All Government Agencies are invited to participate, particularly the C<sup>2</sup> Focal Points from each agency.

**Classification:** Unclassified

**Sponsor:** ESC/FMC

**Performer:** ESC/FMC

**Resources:** FY Dollars Staff-years

**Schedule:** Start End

May 97 Oct 98

**Data Base:**

**Publications:**

**Category:** I.B

**Keywords:** Industry, Government, Weapon Systems, Electronics/Avionics, Acquisition Strategy, Survey

### ESC/FMC-4

**Title:** C<sup>2</sup> Cost Information Center Web Site

**Summary:** The C<sup>2</sup> Cost Information Center is a Web Site. It is available for both Government and Industry to use and be joint contributors. The initial scope includes: Estimating Methodology Knowledge Bases, search capability across the entire web site, Commercial Off-the-Shelf (COTS) directories (by vendors, product, & Government contract), COTS Hardware and Software Primers, links to other appropriate sites and periodic articles written by guest writers (senior Government & industry).

**Classification:** Unclassified

**Sponsor:** ESC/FMC

**Performer:** ESC/FMC

Ellen Coakley, ESC/FMCT, and Tecolote Research, Inc.

**Resources:** FY Dollars Staff-years

**Schedule:** Jul 97 Initial Fielding for beta testing  
Feb 98 On ESC/FM Web Page

**Data Base:**

**Publications:**

**Category:** II.B

**Keywords:** Industry, Government, Weapon Systems, Electronics/Avionics, Acquisition Strategy, CER, Estimating, Method

## ESC/FMC-5

**Title:** "Open" Estimating Tool for Software-Intensive Programs with COTS H/W & S/W

**Summary:** This tool can be used to estimate programs that are software-intensive with commercial off-the-shelf (COTS) hardware and COTS software. The initial focus of the tool is on estimating Management Information Systems (MIS)/Automated Information Systems (AIS) - Type Programs. These types of Programs with today's technology are being developed using Fourth Generation Languages (4GLs) and as much COTS software as possible - creating the need for COTS software integration. This tool's primary objective is to be able to estimate this type of environment. The scope of the tool is all acquisition costs for these types of programs, including software maintenance support.

**Classification:** Unclassified

**Sponsor:** ESC/FMC

**Performer:** ESC/FMC  
Ellen Coakley, Peggy Wells, and Tecolote Research, Inc.

**Resources:** FY      Dollars      Staff-years

**Schedule:** Start      End  
Jan 97      Jun 97 (Initial Fielding)  
May 98 (Production release)

**Data Base:** TBD

**Publications:** TBD

**Category:** II.C

**Keywords:** Government, Estimating, Analysis, Weapon Systems, Electronics/Avionics, EMD, Data Collection, Survey, Expert System

## ESC/FMC-6

**Title:** "NOW" Data Collection Process & Analysis

**Summary:** This Data Collection Process will allow Cost/Schedule/Technical and Programmatic Metrics of a Program to be collected electronically "as-you-go" in a program (instead of the back-fill data collection process). It will obtain metrics through-out the life of the Program focusing on metrics that the Contractor already has available. These metrics will be obtained electronically from the contractor and automatically entered into ACE-IT.

**Classification:** Unclassified

**Sponsor:** ESC/FMC

**Performer:** ESC/FMC

Ellen Coakley, ESC/FMCT, and Tecolote Research, Inc.

**Resources:**     FY            Dollars            Staff-years

**Schedule:**     Start            End

Summer 97

Limited effort to date due to lack of funding

**Data Base:**     Title:

**Description:**     Data from Cost Proposals and Cost/Schedule/Technical data for on-contract efforts

**Automation:**     PC ACE-IT Windows-based Automated Cost Data Base

**Publications:**

**Category:**       II.A.1

**Keywords:**       Government, Estimating, Analysis, Weapon System, Electronics/Avionics, EMD, Labor, Overhead/Indirect, Engineering, CPR/CCDR, Data Collection, Data Base

**MINISTRY OF DEFENCE**



<b>Name</b>	Special Procurement Services/Cost Forecasting (SPS/CF) An Agency of the MoD UK	
<b>Address</b>	Elm 1a #187 MoD Abbey Wood Bristol BS34 8JH UK	
<b>Director</b>	Geoff Hollinrake	
<b>Size</b>	Professional:	66
	Support:	2
	Subcontractors:	10
<b>Focus</b>	Cost Forecasting advice and support to the MoD UK.	
<b>Activity</b>	Number of projects in process:	135
	Average duration of a project:	4 months
	Average number of staff members assigned to a project:	3
	Average number of staff-years expended per project:	0.4
	Percentage of effort conducted by subcontractors:	20%

## SPS/CF-1

**Title:** Software Support Cost Model Project (SSCMP)

**Summary:** The overall aim of the SSCMP is to develop a software package to enable procurers, managers, and designers to estimate the costs of support for software over its in-service life. The program started in 1991 with a theoretical feasibility study, followed by a Software Questionnaire Study and Pilot study completed in April 1995. The Pilot Study suggested that the key factors that influence software support costs are not necessarily size, complexity, or age, which are the factors usually identified in current thinking. A Main Study is now underway with the following objectives: to define the factors and effects that have an impact on software support costs and to develop a concept model of software support based on a study of MoD support activities.

**Classification:** Unclassified

**Sponsor:** Specialist Procurement Services - UK MOD  
Mr. D Thombs, 011-44-117-913-2754

**Performer:** BMT Reliability Consultants Ltd, Fareham, UK

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96/97	\$200,000	1.0

**Schedule:**

<u>Start</u>	<u>End</u>
Dec 95	Jan 99

**Data Base:** Using Microsoft Excel to store and manipulate collected data.

**Publications:** Reports on specific activities throughout the program.

**Category:** II.C

**Keywords:** Government, Estimating, Weapon Systems, Concept Development, Software, Data Collection, Mathematical Modeling, Computer Model

## SPS/CF-2

**Title:** Operating and Support Costs Analysis Models (OSCAM)

**Summary:** An aid to reducing the overall through life cost of owning warships by helping in the selection of the equipment fit, and identifying the benefit accrued from early investment in ILS, by modeling the dynamic relationship between the acquisition and the operating and support costs.

**Classification:** Unclassified

**Sponsor:** Specialist Procurement Services - UK MOD  
Mr. B K Tanner (44-117-913-2762)

**Performer:** HVR Consultants, Alton, Hampshire

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$250,000	1.0

**Schedule:**

<u>Start</u>	<u>End</u>
Oct 96	Dec 98

**Data Base:** Title: Powersim

Description:

Automation:

**Publications:**

**Category:** II.C

**Keywords:** Government, Estimating, Ships, Demonstration/Validation, Mathematical Modeling,  
Computer Model

**AIR FORCE INSTITUTE OF TECHNOLOGY**

<b>Name</b>	Graduate School of Logistics and Acquisition Management Air Force Institute of Technology (AFIT/LAS)	
<b>Address</b>	2950 P Street, Building 641 Wright Patterson AFB, OH 45433-7765	
<b>Director</b>	Dr. Roland D. Kankey, (937) 255-7777, ext. 3382	
<b>Size</b>	Professional:	30
	Support:	6
	Consultants:	0
	Subcontractors:	0
<b>Focus</b>	The School's research focus is on logistics and acquisition issues, to include cost analysis, cost management, contracting, and acquisition management. Items reported here are a combination of a faculty research and student thesis projects that are directed by AFIT faculty and worked on as an integral part of the academic program leading to Master of Science degrees.	
<b>Activity</b>	Number of projects in process:	5-10
	Average duration of a project:	15 months
	Average number of staff members assigned to a project:	—
	Average number of staff-years expended per project:	—
	Percentage of effort conducted by consultants:	0%
	Percentage of effort conducted by subcontractors:	0%

**AFIT/LAS-1**

**Title:** Calibration and Validation of the Cocomo II.1997.0 Cost/Schedule Estimating Model to the Space and Missile Systems Center Database

**Summary:** The goal of this study was to determine the accuracy of COCOMO II.1997.0, a software cost and schedule estimating model, using Magnitude of Relative Error, Mean Magnitude of Relative Error, Relative Root Mean Square, and a 25 percent Prediction Level. Effort estimates were completed using the model in default and in calibrated mode. Calibration was accomplished by dividing four stratified data sets into two random validation and calibration data sets using five times resampling. The accuracy results for the calibrated mode were poor, the best having a Mean Magnitude Relative Error of 33.32% (with only 40% of the estimates having a Magnitude of Relative Error less than 25%). It was found that homogeneous data is the key to producing the best results, and the model typically underestimates. The second part of this thesis was to try and improve upon the default mode estimates. This was accomplished by regressing the model estimates to the actual effort. Each original regression equation was transformed and tested for normality, equal variance, and significance. Overall, the results were promising; regression improved the accuracy in three of the four cases, the best having a Mean Magnitude Relative Error of 20.59% (with 75% of the estimates having a Magnitude of Relative Error less than 25%).

**Classification:** Unclassified

**Sponsor:** SMC/FMC, Shirley Tinkler  
MCR, Inc. Sherry Stukes

**Performer:** Wayne A. Bernheisel, advised by Dan Ferens and Dr. David Christensen  
(937) 255-7777, ext. 3382

**Resources:** FY            Dollars            Staff-years

**Schedule:** Start            End  
Sep 96            Aug 97

**Data Base:** Version 2.1 of the SMC Software Database (SWDB) of more than 2,400 programs.

**Publications:** Thesis available from Defense Technical Information Center: AD-A329977

**Categories:** II.A.1, II.A.2, II.D

**Keywords:** Government, Analysis, Estimating, EMD, Life Cycle, Labor, Data Collection, Statistics/Regression, Study

**AFIT/LAS-2**

**Title:** A Cost-Benefit Analysis of Earned Value Management System Criteria

**Summary:** In December 1996, the Cost/Schedule Control Systems Criteria (C/SCSC) was officially replaced by the Earned Value Management Systems (EVMS) criteria. The switch to EVMS, coupled with current acquisition reform changes, has left many wondering what the effects of these changes will be. This thesis defines the costs and benefits of the old C/SCSC, and then compares them. Additionally, this thesis discusses the changes accompanying the switch to EVMS and the effect on the costs and benefits. The marginal costs of C/SCSC are defined as the difference between the costs of a C/SCSC-compliant system and a contractors 'normal' management control system. The marginal system compliance costs are 334 - 481 person days, while the marginal operating costs are 50% of the C/SCSC-compliant operating costs. Fourteen benefits of C/SCSC are detailed in this thesis. The most important benefit discovered was the data reliability that comes with a criteria-compliant management control system. The main difference between C/SCSC

and EVMS is the system certification process. Under C/SCSC, DoD teams would have to certify a contractor's system. Under EVMS, contractors have the ability to self-certify their system (with final government approval). Cost savings may result through self-certification without reductions in the benefits.

**Classification:** Unclassified  
**Sponsor:** OUSD(A&T)API/PM  
**Performer:** Air Force Institute of Technology  
 John Cole and Judson Fussell, advised by Dr. David Christensen, and Dr. Norm Ware  
 (937) 255-7777, ext. 3378  
**Resources:** FY      Dollars      Staff-years  
**Schedule:** Start      End  
 Jun 96      Aug 97  
**Data Base:** Title:      None  
Description:      Articles published in various defense journals and special reports  
Automation:      No  
**Publications:** Thesis available from Defense Technical Information Center: ADA329813  
**Category:** I.B  
**Keywords:** Government, Policy, Weapon Systems, Life Cycle, Integration, Data Collection, Study

### AFIT/LAS-3

**Title:** An Examination of the Demographics and Career Progression of Air Force Institute of Technology Cost Analysis Graduates  
**Summary:** The Air Force Institute of Technology (AFIT) was asked to develop a graduate curriculum to support cost analysts in the acquisition arena in October 1980. The first class entered in May 1982 and graduated in September 1983 with Master of Science degrees in Systems Management. This degree program gained autonomy by offering its first true Master of Science degree in Cost Analysis in 1988. Now there are nearly thirteen years of graduate cost analysts (GCAs) in the workforce. This thesis examined the impact this program has had on these graduates and the Air Force. Surveys were mailed out to 73 of the 75 currently active-duty graduates in the classes from 1983 through 1994. Forty responses were received and evaluated. The general consensus is that the GCA program is very useful to the graduates and beneficial to their careers. The main strengths of the program include the ACEIT software training and the combination of Department of Defense (DOD) application, regression, and statistics. The weaknesses of the program include a lack of training to actually complete a cost estimate and a need for more in-depth education regarding budget topics. Overall, graduates believe this program could not be replaced by a civilian institution.  
**Classification:** Unclassified  
**Sponsor:** None  
**Performer:** Christopher S. Dalton, advised by Lt Col Stephen Giuliano and Dr. Roland Kankey  
 AFIT/LAS, (937) 255-7777, ext. 3382  
**Resources:** FY      Dollars      Staff-years  
**Schedule:** Start      End  
 Jun 96      Aug 97

**Data Base:**

**Publications:** Thesis available from Defense Technical Information Center: AD-A329975

**Category:** II.A.1

**Keywords:** Government, Survey, Study

**AFIT/LAS-4**

**Title:** The Determinants of the Housing Choices of Military Families: Implications for Military Policy

**Summary:** This thesis investigates both the determinants of housing choice of military families, as well as the possible affects on housing choice that changes in policy could have. Data from the 1992 Surveys of Officer and Enlisted Personnel and Their Spouses are weighted to reflect current force structure levels and are used with the multinomial logit technique of maximum likelihood estimation to develop a model that both gives insight into what factors influence military families' housing decisions as well as how policy changes would affect those housing choices. In particular, changes in policies pertaining to tour length, military pay, and closing costs are investigated. This thesis indicates that an increase in the average tour length for military personnel by one year could save 118 million dollars per year in housing costs. Furthermore, an increase in military compensation would save significant amounts of housing funds. Finally, if the military were to pay the transaction costs associated with home sales the homeownership rate would nearly double and the military would recoup two thirds of the funds spent in such a program through decreased military family housing expenses.

**Classification:** Unclassified

**Sponsor:** None

**Performer:** William R. Forster, advised by Dr. H. Leroy Gill and Lt Col Stephen A. Giuliano  
AFIT/LAS, (937) 255-7777, ext. 3382

**Resources:** FY            Dollars            Staff-years

**Schedule:** Start            End  
Jun 96            Aug 97

**Data Base:**

**Publications:** Thesis available from Defense Technical Information Center: AD-A329926

**Category:** II

**Keywords:** Government, Policy, Manpower/Personnel, Operations and Support, Mathematical Modeling, Study

**AFIT/LAS-5**

**Title:** Factors Affecting the Unit Cost of Weapon Systems

**Summary:** This research identifies variables and specifies equations that can be used to estimate the unit production cost of a weapon system. It is concerned with both explanation and prediction. Three major variables identified are cumulative quantity, production rate, and change in regime. Cumulative quantity is used in learning curve theory. Production rate is found in the U-shaped short- and long-run cost curves of economic theory. This study uses the term regime to refer to any major change in the production environment of a weapon system. This research attempts to integrate the use of these three variables. A



change in regime may be due to a change in acquisition strategy, configuration, or manufacturing method. It is recommended that a categorical variable be used to capture the effect of a change in regime. Several specific equations are proposed and discussed. In general, they entail a shift, shift and rotation, or shift and two rotations of the cost-quantity-rate surface due to a change in regime. Many accepted methods of integrating learning and rate do not produce U-shaped rate curves; this study suggests one that does. Principles and equations discussed are applied in modeling the cost history of three missile systems.

**Classification:** Unclassified  
**Sponsor:** USA SSDC/MDSTC  
**Performer:** Mark Glenn, advised by Dr. Roland Kankey and Lt Col Stephen Giuliano  
 AFIT/LAS, (937) 255-7777, ext. 3382  
**Resources:** FY            Dollars            Staff-years  
**Schedule:** Start            End  
                  Jun 96            Aug 97  
**Data Base:**  
**Publications:** Thesis available from Defense Technical Information Center: AD-A329821  
**Category:** II.A.2  
**Keywords:** Government, Estimating, Missiles, Production, Mathematical Modeling, Study

## AFIT/LAS-6

**Title:** Calibration and Validation of the Sage Software Cost/Schedule Estimating System to United States Air Force Databases  
**Summary:** This research entailed calibration and validation of the SAGE Software Cost/Schedule Estimating System, Version 1.7 as a means to improve estimating accuracy for DoD software-intensive systems, and thereby introduce stability into software system development. SAGE calibration consisted of using historical data from completed projects at the Space and Missile Systems Center (SMC) and the Electronic Systems Center (ESC) to derive average performance factors (i.e., calibration factors) for pre-defined categories of projects. A project was categorized for calibration by either its primary application or by the contractor that developed it. The intent was to determine the more appropriate categorization for calibration. SAGE validation consisted of using the derived calibration factors to predict completed efforts, not used in deriving the factors. Statistical resampling employing Monte Carlo simulation was used to calibrate and validate the model on each possible combination of a category's projects. Three statistical measures were employed to measure model performance in default and calibrated estimating modes. SAGE generally did not meet pre-established criteria for estimating accuracy, although the model demonstrated some improvement with calibration. Calibration of projects categorized by contractor resulted in better calibrated model performance than calibration of projects categorized by application. This categorization is suggested for future consideration.  
**Classification:** Unclassified  
**Sponsor:** SMC/FMC, Shirley Tinkler  
 MCR, Inc. Sherry Stukes  
**Performer:** David Marzo, advised by Daniel Ferens and Dr. David Christensen  
 AFIT/LAS, (937) 255-6280

**Resources:** FY Dollars Staff-years  
**Schedule:** Start End  
 Sep 96 Aug 97  
**Data Base:** Version 2.1 of the SMC Software Database (SWDB) of more than 2,400 programs.  
**Publications:** Thesis available from Defense Technical Information Center: AD-A329958  
**Categories:** II.A.1, II.A.2, II.D  
**Keywords:** Government, Analysis, Estimating, EMD, Life Cycle, Labor, Data Collection, Statistics/Regression, Study

## AFIT/LAS-7

**Title:** Calibration and Validation of the Checkpoint Model to the Air Force Electronic Systems Center Software Database

**Summary:** This research effort focused on the calibration and validation of CHECKPOINT Version 2.3.1, a computerized software cost estimating tool, to the USAF Electronic Systems Center (ESC) software database. This thesis is a direct follow-on to a 1996 CHECKPOINT study at the Air Force Institute of Technology, which successfully calibrated and validated CHECKPOINT to the SMC software database. While this research generally parallels the methodology in the aforementioned study, it offers advancements in the CHECKPOINT calibration and validation procedure, and it refines the data stratification process and the statistical analyses employed. After stratifying the ESC software database into ten usable data sets, the author calibrated and validated the CHECKPOINT model on each data set. Although the results of this study exhibited occasional improvements in estimating accuracy for both the calibration and validation subsets, the model generally failed to satisfy the accuracy criteria used to assess overall calibration success and estimating accuracy ( $MMRE \leq 0.25$ , and  $PRED(0.25) \geq 0.75$ ). Thus, the CHECKPOINT model was not successfully calibrated or validated to the 1997 version of the ESC database. The results of this study illuminate the need for complete, accurate and homogeneous data as a requirement for a successful calibration and validation effort.

**Classification:** Unclassified

**Sponsor:** ESC/FMCT  
 Hanscom AFB, MA 01731-2117

**Performer:** Thomas Shrum, advised by Daniel Ferens and Dr. David Christensen  
 AFIT/LAS, (937) 255-6280

**Resources:** FY Dollars Staff-years

**Schedule:** Start End  
 Sep 96 Aug 97

**Data Base:** Electronic System Center Software Database

**Publications:** Thesis available from Defense Technical Information Center: AD-A329908

**Categories:** II.A.1, II.A.2, II.D

**Keywords:** Government, Analysis, Estimating, EMD, Life Cycle, Labor, Data Collection, Statistics/Regression, Study

**AFIT/LAS-8**

**Title:** A Study of Historical Inflation Forecasts Used in the Department of Defense Future Years Defense Program

**Summary:** This thesis explores historical inflation forecasts used in the Department of Defense (DoD) Future Years Defense Program. The study examines historical DoD forecasts against experienced inflation as measured by the Gross National Product and Gross Domestic Product implicit price deflator (GNP/GDP IPD) from 1979 to 1996. This study also compares the accuracy of DoD forecasts with those made by the Congressional Budget Office (CBO) and Data Resources, Incorporated (DRI). The results regarding the performance of historical DoD inflation forecasts are mixed. Upon examining budget through five-year GNP/GDP IPD forecast spans, DoD short-term results do not indicate a downward bias and DoD long-term results do indicate a downward bias. Overall DoD forecast bias was lower than the CBO and DRI, which tended to overestimate inflation. Next, forecast accuracy was evaluated in which all agencies equally anticipated budget year inflation. Forecasts for later years also yielded mixed results. CBO and DRI forecasts tend to exhibit less dispersion, but DoD tends to have less bias. DRI one, two, and three year forecasts and CBO four and five year projections demonstrated the least dispersion while DoD forecast results were more dispersed. Possible explanations and implications of these findings are provided.

**Classification:** Unclassified

**Sponsor:** SAF/FMCE  
1130 Air Force  
The Pentagon  
Washington, DC 20330-1120

**Performer:** Mark Sweitzer, advised by Dr. Roland Kankey, Dr. David Christensen, and Dr. Anthony D'Angelo  
AFIT/LAS, (937) 255-6280

**Resources:** FY            Dollars            Staff-years

**Schedule:** Start            End  
Sep 96            Aug 97

**Data Base:**

**Publications:** Thesis available from Defense Technical Information Center: AD-A329995

**Category:** II.A.1

**Keywords:** Government, Analysis, Data Collection, Study

**AFIT/LAS-9**

**Title:** Tracking Overhead Orta Costs in Technology Transfer Activities

**Summary:** An ever shrinking Research and Development (R&D) budget, coupled with a widespread perception in industry and government that the nation is not realizing an adequate return from its substantial investment in the federal laboratory system, has paved the way for an increase in the transfer of technology from the federal laboratories to the private sector. However, the increase in technology transfer comes at a price as each federal laboratory with 200 or more scientific, engineering, or related positions is required to have at least one full time Office of Research and Technology Applications (ORTA) position. The objective of this research is to determine the indirect cost of performing technology transfer by identifying the resources consumed by several key ORTA organizations and the activities performed within these organizations. A previous research effort into the direct labor side of technology transfer activities identified several steps of the Transfer

Master Process that had little or no resources expended. It was hypothesized that the ORTA organizations, which are considered indirect labor by most costing methods, would expend considerable portions of their resources on these activities. This hypothesis was supported, as all but two of the identified steps consumed a significant portion of the ORTA resources. The two steps that were insignificant deal with the collection of revenues, which either take little time to complete or were performed by the financial management branch of the laboratory instead of at the ORTA. It was also hypothesized that comparisons could be made among the various ORTAs to determine a "step-wise" level of resources expended based on the amount of technology being transferred. This hypothesis was not supported, however, as there was too much variance in resources consumed to technology transfer activity level among the ORTAs researched.

**Classification:** Unclassified  
**Sponsor:** AFRL/TTO  
 Wright Patterson AFB, OH 45433  
**Performer:** Thomas Van Egeren, advised by MAJ Richard Franza and Dr. David Christensen  
 AFIT/LAS, (937) 255-6280  
**Resources:** FY            Dollars            Staff-years  
**Schedule:** Start            End  
 Sep 96            Aug 97  
**Data Base:**  
**Publications:** Thesis available from Defense Technical Information Center: AD-A329941  
**Category:** I.B  
**Keywords:** Government, Budgeting, Overhead/Indirect, Data Collection, Study

# AFIT/LAS-10

**Title:** The Impact of the Packard Commission's Recommendations on Reducing Cost Overruns in Major Defense Acquisition Programs  
**Summary:** This thesis examines the impact that recommendations made by the President's Blue Ribbon Commission on Defense Management, informally known as the Packard Commission, had on reducing cost overruns in major DoD acquisition programs. Cost overruns are a recurring problem in the DoD, and the study of possible effects resulting from the implementation of acquisition reform efforts such as the Packard Commission study could alter this trend. In this era of acquisition reform and downsizing it's important that policy makers understand the effects past and current policies have had and are having on reducing the ever present problem of cost overruns. Conclusions drawn in this thesis may guide and direct DoD policy makers in drafting future regulations and policies. This study examined 269 contracts completed between January 1, 1988 and December 31, 1995. It was found that cost performance for contracts completed after the recommendations went into effect was poorer than cost performance prior to the change. It was also found that a more significant difference occurred between contracts in development phases than those in production phases. In fact, percentage cost overruns for development contracts nearly tripled after the policy went into effect. Possible explanations and implications of this discovery are provided.  
**Classification:** Unclassified  
**Sponsor:** None  
**Performer:** David Searle, advised by MAJ Caisson Vickery and Dr. David Christensen  
 AFIT/LAS, (937) 255-6280

**Resources:** FY Dollars Staff-years  
**Schedule:** Start End  
 Sep 96 Aug 97  
**Data Base:**  
**Publications:** Thesis available from Defense Technical Information Center: AD-A329942  
**Category:** I.A  
**Keywords:** Government, Analysis, Weapon Systems, EMD, Production, CPR/CCDR, Data Collection, Study

# **AFIT/LAS-11**

**Title:** Estimating KC-137 Aircraft Ownership Costs in the Brazilian Air Force (BAF)  
**Summary:** This research addresses the estimation of operation and support (O&S) costs of the Brazilian Air Force KC-137 aircraft. BAF lacks an established set of procedures for computing life cycle costs, which prejudices the management of the KC-137 program. The purpose of the study is to develop an O&S cost breakdown structure and a set of cost estimating equations in order to calculate the ownership costs of the KC-137 aircraft. The research is divided into five parts: 1) review of the most commonly used LCC accounting methods; 2) analysis of the KC-137 O&S systems and database characteristics; 3) development of an O&S cost breakdown structure based on the CORE model; 4) selection of cost estimating procedures; and 5) development of cost equations and calculation of costs. The annual KC-137 O&S costs resulted in US \$9,529 per flight-hour at a yearly usage rate of 1700 hours. The study yielded evidence that the current O&S systems incur a high percentage of fixed costs (57.5%) and allocated costs (43.2%). Therefore, the BAF may benefit from the use of LCC and more accurate cost accounting methods, such as activity-based costing. Other implications for the Brazilian Air Force and recommendations for further research are also discussed.

**Classification:** Unclassified  
**Sponsor:** None  
**Performer:** Ulisses Bonasser (BAF), advised by Dr. Roland Kankey (LAS) and MAJ William Scott LAL, (937) 255-6280

**Resources:** FY Dollars Staff-years  
**Schedule:** Start End  
 Sep 96 Aug 97

**Data Base:**  
**Publications:** Thesis available from Defense Technical Information Center: AD-A331196  
**Category:** II  
**Keywords:** Government, Analysis, Aircraft, Operations and Support, Data Collection, Study

**AFIT/LAS-12**

**Title:** Economic Analysis for an F-22 Organic vs. Contractor Aircraft Battle Damage Repair Ownership Decision

**Summary:** The purpose of this study was to evaluate whether Contractor Logistics Support (CLS) is a viable alternative to Combat Logistics Support Squadrons (CLSSs) for providing F-22 Aircraft Battle Damage Repair (ABDR). Legalities, practicalities, and cost-effectiveness were key ownership concerns. United States Code, Office of Management and Budget, Department of Defense (DoD), and United States Air Force (USAF) requirements were reviewed to address legal and policy issues and whether F-22 ABDR is military essential. The Army's Logistics Civil Augmentation Program (LOGCAP) award fee history was used to assess the potential performance of F-22 ABDR CLS personnel. F-117 ABDR team requirements and costs were used to estimate F-22 CLSS costs. Results show DoD must decide if F-22 ABDR is a core logistics function and the USAF must determine F-22 ABDR requirements before outsourcing legality is clear. However, DoD civilian reliance continues today, and LOGCAP experiences attest that contractors consistently meet or exceed all clearly stated requirements. Analysis found that CLSS will provide higher combat readiness; although, CLS may provide slightly less combat readiness, but for potentially less cost. A dual approach, using a mixture of CLSS and CLS, could provide the most effective capability in terms of both combat readiness and cost.

**Classification:** Unclassified

**Sponsor:** SM-ALC/LATB

**Performer:** John Kitchens, advised by MAJ Chris Burke (LAL) and LTC Stephen Giuliano  
LAS, (937) 255-6280

**Resources:** FY                      Dollars                      Staff-years

**Schedule:** Start                      End  
Sep 96                      Aug 97

**Data Base:**

**Publications:** Thesis available from Defense Technical Information Center: AD-A329925

**Category:** I.A

**Keywords:** Government, Analysis, Aircraft, Operations and Support, Economic Analysis, Study

**AFIT/LAS-13**

**Title:** A Preliminary Study of Using the SEI's Capability Maturity Model to Set Statistical Control Bounds on DoD Contractor Cost and Schedule Performance

**Summary:** Current methods for monitoring the performance of Department of Defense (DOD) software development contractors have not been successful in reversing the current trend of over budget and behind schedule software development. The DOD has adopted the Software Engineering Institute's (SEI's) Capability Maturity Model (CMM) as a method of determining the process maturity of a software developer with the idea that a more mature process will lead to improved cost and schedule performance. The goal of this research was to determine if a model based on the CMM rating level of a contractor could be developed and used in conjunction with statistical process control to determine if contractor performance was progressing in a satisfactory manner. To investigate this possibility descriptive statistics were applied to historical contractor performance data and a model was established. A different set of historical data was then used to evaluate the performance of the new model. This performance was then compared to the performance of current methods of statistical control. The results obtained in this research

suggest that using the CMM rating level of a contractor to set statistical control bounds is as good, and perhaps better than, the current method being employed.

**Classification:** Unclassified  
**Sponsor:** AFCA/XPS  
Scott AFB, IL 62225  
**Performer:** Jeffrey Schaefer, advised by Daniel Ferens and MAJ Terry Alder  
AFIT/LAS, (937) 255-6280  
**Resources:** FY Dollars Staff-years  
**Schedule:** Start End  
Sep 96 Aug 97  
**Data Base:**  
**Publications:** Thesis available from Defense Technical Information Center: AD-A329855  
**Category:** II.D  
**Keywords:** Government, Analysis, Software, CPR/CCDR, Data Collection, Study

#### AFIT/LAS-14

**Title:** Cost Per Flying Hour Analysis of the C-141  
**Summary:** This paper sought to examine if DoD's current transfer pricing method places AMC in a price competitive position with the government commercial rates and promotes managers to make the best decisions. Attention was paid to the stated customer concerns that current transfer pricing methods incorporate overhead and sunk costs that are not attributable to routine movement of peacetime cargo and could make AMC non-price competitive with commercial vendors. The findings are that AMC currently uses full cost transfer pricing, as required by DoD policy, that include significant overhead and sunk costs associated with its wartime responsibilities. The full cost method of transfer pricing is not in congruence with the generally accepted accounting practices and the private sector position that, with excess capacity and no outside market, a unit should transfer price at variable cost. The current cost per flying hour is inflated by fixed costs, primarily overhead and sunk cost, by 60.47 percent. This means the CPFH is 2.5 times greater than the cost that AMC incurs for operating a peacetime mission.

**Classification:** Unclassified  
**Sponsor:** None  
**Performer:** Christopher Omlor, advised by Dr. William Cunningham and MAJ William Scott  
AFIT/LAL, (937) 255-2820  
**Resources:** FY Dollars Staff-years  
**Schedule:** Start End  
Sep 96 Aug 97  
**Data Base:**  
**Publications:** Thesis available from Defense Technical Information Center: AD-A329936  
**Category:** II.A.1  
**Keywords:** Government, Analysis, Aircraft, Operations and Support, Fixed Costs, Variable Costs, Data Collection, Study

**AFIT/LAS-15**

**Title:** Activity-Based Costing in Logistics  
**Summary:** Study of the nature, extent, and impact of activity-based costing in logistics operations of firms.  
**Classification:** Unclassified  
**Sponsor:**  
**Performer:** MAJ Mark Caudle  
AFIT/LAS, (937) 255-7777, ext. 3370  
**Resources:** FY Dollars Staff-years  
**Schedule:** Start End  
Fall 95 Fall 98(Projected)  
**Data Base:**  
**Publications:** Dissertation available from Defense Technical Information Center by Spring 1999.  
**Category:** II.A.1  
**Keywords:** Industry, Analysis, Operations and Support, Survey, Study

**AFIT/LAS-16**

**Title:** A Return on Investment Model for Technology Transfer  
**Summary:** The purpose of this research is to develop a return on investment (ROI) model for potential use by those holding the Research & Development "purse strings" at the laboratory level. This model will estimate return on investment of individual cooperative research and development agreements (CRDAs) to determine which to pursue in order to maximize RDT&E return on investment. Presently, the Air Force does not have an ROI model in place for CRDA evaluation. The basis for this model is the Multiattribute Decision Analysis methodology of Canada & Sullivan.  
**Classification:** Unclassified  
**Sponsor:** AFRL/XP, Steve Guilfoos  
**Performer:** Brad McDonald, advised by MAJ Rick Franza and MAJ Daryl Hauck  
AFIT/LAS, (937) 255-6280  
**Resources:** FY Dollars Staff-years  
**Schedule:** Start End  
Sep 97 Aug 98  
**Data Base:**  
**Publications:** Thesis will be available from DTIC in Winter 1998.  
**Categories:** II.B, II.C  
**Keywords:** Government, Estimating, Airframe, Propulsion, Electronics/Avionics, Concept Development, Fixed Costs, Variable Costs, Data Collection, Survey, Mathematical Model



**AFIT/LAS-17**

**Title:** Multinational Communications Satellite Cost Study

**Summary:** It is generally believed that a multinational satellite development effort will save money over a single-nation development. This view may be short-sighted, ignoring additional costs associated with integrating the project management efforts of multiple, international contractors. While the technical details of such an effort were addressed in the Future MILSATCOM Architecture Study (FMAS), this study seeks to determine the costs associated with integrating the project management efforts of multiple, international contractors in a multinational project development effort. This study will compare the project management approaches and actual data from the FMAS study with other completed, published efforts, and published approaches to multinational cooperation.

**Classification:** Unclassified

**Sponsor:** Air Force Cost Analysis Agency

**Performer:** David Bach, advised by Dr. Roland Kankey, LAS, and MAJ Bryan Turner  
LSS, (937) 255-6280

**Resources:** FY                      Dollars                      Staff-years

**Schedule:** Start                      End  
Sep 97                      Aug 98

**Data Base:**

**Publications:** Thesis will be available from DTIC in Winter 1998.

**Category:** II.D

**Keywords:** Government, Analysis, Space Systems, Data Collection, Study

**AFIT/LAS-18**

**Title:** Fighter CERS and Seemingly Unrelated Regressions

**Summary:** This study compares the ability of individual CERS for engineering, tooling, manufacturing, and quality control developed using ordinary least squares regression with those developed using Seemingly Unrelated Regression (SUR). The study tests the hypothesis that SUR will take advantage of relationships existing between the error terms of the different equations and result in more accurate cost estimates.

**Classification:** Unclassified

**Sponsor:** Mr. John Dorsett, Air Force Cost Analysis Agency

**Performer:** Robert Bickel and Lance Whitfill, advised by Dr. Roland Kankey and MAJ Daryl Hauck  
LAS, (937) 255-6280

**Resources:** FY                      Dollars                      Staff-years

**Schedule:** Start                      End  
Sep 97                      Aug 98

**Data Base:**

**Publications:** Thesis will be available from DTIC in Winter 1998.

**Category:** II.B

**Keywords:** Government, Estimating, Aircraft, Statistics/Regression, CER

**AFIT/LAS-19**

**Title:** Software Support Cost Estimating Models: a Comparative Study of What the Models Estimate

**Summary:** A follow on effort to the Coggins-Russell AFIT Thesis 1993. This study compares five software-estimating models: SoftEst, SEER-SEM, Price-S, SoftCost-OO, and SPR-Knowledge Plan 2.0. This study will concentrate on the estimation of support costs for each of the given models and address the following questions: What time span is the maintenance/support option covering for the various models? Does it match the inventory time period for the Air Force? What phases of support are covered by the various models? What are the unique input parameters that directly affect the support costs? What estimating methodology is being used? What is the underlying basis for the parameter values? Does a change in development method or language affect support costs? How does a compression of schedule affect support costs? Does a change in size affect the support costs? What is the recommended estimating range? What type of data/database was the current model calibrated to?

**Classification:** Unclassified

**Sponsor:** Captain Dave Marzo, Air Force Cost Analysis Agency

**Performer:** Kevin Brummert and Phil Mischler, advised by Dan Ferens and MAJ Daryl Hauck  
LAS, (937) 255-6280

**Resources:** FY                      Dollars                      Staff-years

**Schedule:** Start                      End  
Sep 97                      Aug 98

**Data Base:**

**Publications:** Thesis will be available from DTIC in Winter 1998.

**Categories:** IIA.2, II.D

**Keywords:** Government, Analysis, Estimating, Operations and Support, Weapon Systems, Software, Case Study, Study

**AFIT/LAS-20**

**Title:** A Quantitative Cost Analysis of the First High Altitude Endurance Unmanned Aerial Vehicle - the Global Hawk

**Summary:** This thesis discusses the history of unmanned aerial vehicles (UAV), the current and near term capabilities of the modern UAV, and compares the Global Hawk UAV production cost and operating and support cost to a comparable manned system - the U-2.

**Classification:** Limited Distribution / Classified Appendix

**Sponsor:** ASC/RAV

**Performer:** Brian Kehl and Mike Wilson, advised by LtCol Terry Adler and MAJ Daryl Hauck  
LAS, (937) 255-6280

**Resources:** FY                      Dollars                      Staff-years

**Schedule:** Start                      End  
Sep 97                      Aug 98

**Data Base:**

**Publications:** Thesis will be available from DTIC in Winter 1998.

**Category:** II.A.1  
**Keywords:** Government, Estimating, Analysis, Case Study, Study

#### **AFIT/LAS-21**

**Title:** Predictive Reliability of the Contractor Performance Assessment Report (CPAR) Process  
**Summary:** This study evaluates the predictive reliability of the CPAR process by comparing CPAR ratings with actual cost & schedule variances. The study will also look into other relationships such as past performance rating vs. profitability.  
**Classification:** Limited distribution  
**Sponsor:** Mr. Thomas Fowler, ASC/SYG  
**Performer:** John Odum, advised by LtCol Stephen Giuliano and MAJ Daryl Hauck  
LAS, (937) 255-6280  
**Resources:** FY            Dollars            Staff-years  
**Schedule:** Start            End  
Sep 97            Aug 98  
**Data Base:**  
**Publications:** Thesis will be available from DTIC in Winter 1998. Distribution must be approved by ASC/SYG.  
**Category:** II.A.1  
**Keywords:** Government, Analysis, CPR/CCDR, Study

#### **AFIT/LAS-22**

**Title:** Cost/Benefit Analysis of Air Refueling Options for the North Pacific Theatre  
**Summary:** This study will assess the number of flying hours used to position tankers/crews in Alaska to support routine peacetime air refueling requirements in the North Pacific. It will then compare various options for increasing tanker support in Alaska. Options to be considered include: increasing the Primary Aircraft Assigned (PAA) of the only tanker unit in Alaska; the reverse associate unit concept; and a temporary duty tanker task force. This study will also address less quantifiable measures such as the impact of increased tanker availability to the Pacific Air Expeditionary Force (AEF) and other world-wide contingencies.  
**Classification:** Unclassified with references to classified OPLANS, CONPLANS, and Pony Express Taskings  
**Sponsor:**  
**Performer:** Mike Rauenhorst, Air Mobility Warfare Center, Ft Dix, NJ, advised by Dr. Roland Kankey, AFIT/LAS  
**Resources:** FY            Dollars            Staff-years  
**Schedule:** Start            End  
Jan 98            Jun 98  
**Data Base:**  
**Publications:**  
**Category:** II  
**Keywords:** Government, Analysis, Aircraft, Operations and Support, Case Study, Study

**DEFENSE SYSTEMS MANAGEMENT COLLEGE**

<b>Name</b>	Defense Systems Management College		
<b>Address</b>	9820 Belvoir Road Building 206, Room 215 Fort Belvoir, VA 22060		
<b>Director</b>	Sharon Richardson, (703) 805-4455		
<b>Size</b>	Professional:	11	
	Support:	2	
	Consultants:	0	
	Subcontractors:	0	
<b>Focus</b>	Cost Analysis, Budget Process, Funds Management		
<b>Activity</b>	Number of projects in progress:	12	
	Average duration of project:	3 months	
	Average number of staff members assigned to a project:	1-2	
	Average number of staff-years expended per project:	0.1	
	Percentage of effort conducted by consultants:	0%	
	Percentage of effort conducted by subcontractors:	0%	

**DSMC-1**

**Title:** Research on Ongoing Acquisition Research (ROAR)

**Summary:** ROAR is an on-line and World-Wide Web system available to DoD and university researchers who currently conduct studies on acquisition-related topics such as cost modeling and pricing concerns, engineering and manufacturing practices, industrial base issues, logistics, contracting, commercial practices, acquisition workforce management, and education, etc. Access is available via the ROAR BBS (703-805-2865) and voice (703-271-5988) for those who contribute from their own ongoing study.

**Classification:** Unclassified

**Sponsor:** Defense Systems Management College and Defense Acquisition University  
Fort Belvoir, VA 22060

Mr. James Abellera, (703) 805-2525

**Performer:** DSMC Faculty

**Resources:** FY            Dollars            Staff-years

**Schedule:**    Start            End  
89                    Continuing

**Data Base:** *Title:*

*Description:* ROAR tracks over 2,500 studies around the world.

*Automation:* ROAR data became accessible via the Internet in the second half of CY 1995. The URL for ROAR is: <http://www.dsmc.dsm.mil/roar.html>.

**Publications:** New search results are available electronically every week via the ROAR BBS for registered subscribers until their projects are completed.

**Category:** I.B

**Keywords:** Industry, Government, Data Collection, Data Base

**AEROSPACE CORPORATION**

<b>Name</b>	The Aerospace Corporation Cost and Requirements Department	
<b>Address</b>	2350 E. El Segundo Boulevard El Segundo, CA 90245  Mail Station: M4/021 P.O. Box 92957 Los Angeles, CA 90009-2957	
<b>Director</b>	Dr. Steven Glaseman, (310) 336-8576	
<b>Size</b>	Professional:	15
	Support:	1
	Consultants:	About 1,000 Aerospace Corporation Engineers
	Subcontractors:	0
<b>Focus</b>	Acquisition reform, requirements engineering, relationship between requirements and cost, commercial practices, cost as an independent variable, space-system cost modeling, cost-risk analysis, schedule-risk analysis, statistical analysis, life-cycle cost analysis, cost/performance/design trade studies.	
<b>Activity</b>	Number of projects in process:	6
	Average duration of a project:	1 year
	Average number of staff members assigned to a project:	2
	Average number of staff-years expended per project:	1.0
	Percentage of effort conducted by consultants:	
		(Aerospace Corp. Engineers) 20%
	Percentage of effort conducted by subcontractors:	0%



## AERO-1

**Title:** Costs of Space, Launch, and Ground Systems

**Summary:** Historical costs of space, launch, and ground systems, including non-recurring and recurring costs of military and civil space and launch vehicles, payloads, launch processing, launch delays, launch failures, software, ground facilities, learning rates, cost overruns, etc.

**Classification:** Unclassified; Government/FFRDC-only; Contractor-Proprietary Data.

**Sponsor:** The Aerospace Corporation's Internal Research and Development (IR&D) Program.

**Performer:** The Aerospace Corporation  
MS: M4/021  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
S. A. Book, (310) 336-8655  
E-mail: stephen.a.book@aero.org

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$100,000	0.6

**Schedule:**

<u>Start</u>	<u>End</u>
FY87	None (Maintenance ongoing)

**Data Base:** Contractor-Proprietary

**Publications:** "Costs of Space, Launch, and Ground Systems," The Aerospace Corporation, Corporate Briefing ("The Whitehair Study"), April 1997.

**Category:** II.A

**Keywords:** Government, Policy, Space Systems, Life Cycle, Acquisition Strategy, Data Collection, Case Study, Data Base, Study

## AERO-2

**Title:** Validation Testing of Commercial Risk-Analysis Software

**Summary:** Government-requested validation testing of commercial risk-analysis software products is an ongoing research effort. Some test cases investigate handling of simple, routine tasks, others "push the envelope" of their limitations and advertising. Most recently tested software was Risk Driver (Decision Products, Inc.). Currently under consideration for test is RISK Version 2.2 developed by Tecolote Research, Inc., for inclusion in ACE-IT. Deficiencies specifically noted in controlled-access, government/FFRDC-only, validation testing reports delivered to SMC/FMC locally for forwarding to AFCAA and SAF/FM. AF personnel at their option may pass on explanations of deficiencies to developers.

**Classification:** Unclassified, Controlled-Access, Government/FFRDC Only

**Sponsor:** AF Space and Missile Systems Center/FMC acting also on behalf of Air Force Cost Analysis Agency (AFCAA) and Office of Secretary of the Air Force/Financial Management (SAF/FM)

**Performer:** The Aerospace Corporation  
MS: M4/021  
P.O. Box 92957  
Los Angeles, CA 90009-2957

S. A. Book, (310) 336-8655  
E-mail: stephen.a.book@aero.org

**Resources:**     FY             Dollars             Staff-years  
                         98             \$14,000             0.1

**Schedule:**     Start             End  
                         Dec 97             Feb 98

**Data Base:**     None

**Publications:**     S. A. Book and P. H. Young, "Validation Report on PLAN<sup>TM</sup> Risk Modeling Software," The Aerospace Corporation, 66 pages, 8 April 1992. (U.S. Government/FFRDC only).  
                         S. A. Book and E. L. Burgess, "Validation Report on CRYSTAL BALL Risk Modeling Software," The Aerospace Corporation, 74 pages, 5 January 1993. (U.S. Government/FFRDC only).  
                         S. A. Book, N. R. Chunduri, and P. H. Young, "Validation Report on RISK Risk Modeling Software," The Aerospace Corporation, 58 pages, 19 March 1993. (U.S. Government/FFRDC only).  
                         S. A. Book, N. R. Chunduri, and P. H. Young, "Validation Report on @RISK Risk Modeling Software," The Aerospace Corporation, 78 pages, 6 April 1993. (U.S. Government/FFRDC only).  
                         S. A. Book, O. F. Blackshire, and P. H. Young, "Validation Report on RISK+ Risk Modeling Software for Microsoft Project 4.0," The Aerospace Corporation, 141 pages, 6 October 1995. (U.S. Government/FFRDC only).  
                         C. J. Latta, O. F. Blackshire, and S.A. Book, "Evaluation Report on Risk Driver: A Tool for Preemptive Project Risk Management," The Aerospace Corporation, 110 pages, 2 February 1998. (U.S. Government/FFRDC only).

**Categories:**     I.C.2, II.D

**Keywords:**     Government, Estimating, Risk/Uncertainty, Mathematical Modeling, Review

## AERO-3

**Title:**             Small-Satellite Cost Engineering Model

**Summary:**     Integration of physical, engineering, and cost relationships, encompassing new generation of low-weight, single-purpose, short-lifetime tactical satellites. Goal is to allow analyst to investigate in real time cost impacts of performance changes.

**Classification:**     Unclassified, Government-only, Contractor-Proprietary Data

**Sponsor:**     NASA Jet Propulsion Laboratory

**Performer:**     The Aerospace Corporation  
                         MS: M4/939  
                         P.O. Box 92957  
                         Los Angeles, CA 90009-2957  
                         A. B. Dawdy, (310) 336-6134  
                         V. M. Canales, (310) 336-8350

**Resources:**     FY             Dollars             Staff-years  
                         98             \$100,000             0.6

**Schedule:**     Start             End  
                         Jan 94             None (Maintenance ongoing)

**Data Base:** Recent historical costs and technical parameters of new generation of small satellites and launch vehicles.

**Publications:** D. A. Bearden, E. L. Burgess, and N. Y. Lao, "Small-Satellite Cost Study," The Aerospace Corporation, publicly releasable briefing containing no proprietary information.

K. D. Bell, A. B. Dawdy, and L. A. Hsu, "Cost-Effective Concept Definition Using an Integrated Cost Engineering Model Process," The Aerospace Corporation.

**Categories:** I.B, II.A.2, II.C, II.D

**Keywords:** Government, Estimating, Space Systems, Production, Engineering, Data Collection, Computer Model

#### AERO-4

**Title:** Small-Satellite Cost Study

**Summary:** Data gathering and CER development, encompassing new generation of low-weight, single-purpose, short-lifetime tactical satellites. Implemented in test-and-evaluation version of computer model. Assist NASA HQ in non-advocate reviews of Center-initiated funding proposals.

**Classification:** Unclassified; Government-only, Contractor-Proprietary Data

**Sponsor:** NASA Langley Research Center

**Performer:** The Aerospace Corporation  
MS: M4/021  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
T. J. Mosher, (310) 336-1203  
N. Y. Lao, (310) 336-7876

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	98	\$60,000	0.3

**Schedule:** Start Jan 91      End None (maintenance and upgrades ongoing)

**Data Base:** Recent historical costs and technical parameters of new generation of small satellites and launch vehicles.

**Publications:** "Small-Satellite Cost Study," publicly releasable briefing containing no proprietary information.

**Categories:** I.B, II.A.1, II.B, II.D

**Keywords:** Government, Estimating, Space Systems, Production, Engineering, Data Collection, Data Base, Computer Model, CER

#### AERO-5

**Title:** Ground Systems Cost Model (G-Cost)

**Summary:** Joint project with The MITRE Corporation's Economic and Decision Analysis Center, Bedford, MA 01730. Model costs of ground systems hardware, software, operations, and maintenance. Derive CERs from historical data when available, from vendor quotes when

appropriate. Include satellite control facilities and equipment, communications equipment, launch processing, and security needs (see MITRE-2).

**Classification:** Unclassified, some Contractor-Proprietary Data  
**Sponsor:** Aerospace Corporation Internal Research and Development (IR&D) Program  
**Performer:** The Aerospace Corporation  
MS: M4/021  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
L. B. Sidor, (310) 336-1571  
**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$50,000	0.4

**Schedule:**

<u>Start</u>	<u>End</u>
Oct 97	Sep 98

**Data Base:** Cost and technical data  
**Publications:** A. J. Matthews, "A Ground Cost Model (G-COST) for Military Systems," AIAA, 28 February 1996.  
**Categories:** II.A, II.C  
**Keywords:** Government, Estimating, Facilities, Manpower/ Personnel, Life Cycle, Labor, Fixed Costs, Variable Costs, Data Collection, Statistics/Regression, Computer Model

## AERO-6

**Title:** Formation of Corporate Concept Design Center  
**Summary:** Establish central focal point for applying distributed concurrent-engineering methodology to utilize broad engineering expertise and in-house cost and performance models to produce conceptual designs for space, launch, and ground systems. Rapid development of system designs in response to performance-requirement adjustments will allow quick-turnaround system- and component-level performance assessment and life-cycle-cost analysis.  
**Classification:** Unclassified  
**Sponsor:** The Aerospace Corporation's Research Program  
**Performer:** The Aerospace Corporation  
MS: M4/021  
P.O. Box 92957  
Los Angeles, CA 90009-2957  
A. B. Dawdy, (310) 336-6134  
V. M. Canales, E. T. Davalos; (310) 336-8222  
**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$200,000	1.1

**Schedule:**

<u>Start</u>	<u>End</u>
Oct 96	Sep 97

**Data Base:** None.  
**Publications:** None as yet  
**Categories:** II.B, II.C, II.D

**Keywords:** Government, Estimating, Space Systems. Concept Development, Engineering, Mathematical Modeling, Computer Model

**MITRE CORPORATION**

<b>Name</b>	The MITRE Corporation The Economic and Decision Analysis Center (EDAC)	
<b>Address</b>	1820 Dolley Madison Boulevard McLean, VA 22102	
<b>Director</b>	Dr. William Hutzler, (703) 883-6911	
<b>Size</b>	Professional:	85
	Support:	10
	Consultants:	0
	Subcontractors:	0
<b>Focus</b>	Applied economic analysis, cost analysis, decision support, acquisition analysis, nondevelopmental item acquisition, program management, risk management and analysis, life cycle management, logistics engineering, business process reengineering, business and technology case analysis, and information services and technology benchmarking.	
<b>Activity</b>	Number of projects annually:	180
	Average duration of a project:	6 months
	Average number of staff members assigned to a project:	2
	Average number of staff-years expended per project:	0.5
	Percentage of effort conducted by consultants:	0%
	Percentage of effort conducted by subcontractors:	0%

## MITRE-1

**Title:** A Predictive Pricing Model for Asynchronous Transfer Mode (ATM) Public Services

**Summary:** The telecommunications industry is evolving toward powerful gigabit networks that support diverse technologies and applications. ATM, with its capability to integrate multimedia (voice, data, and video) on the same transmission facility, is the technology of choice for telecommunications upgrades, particularly in wide-area-networks (WANs). In addition, the Government trend toward purchasing services as opposed to owning or leasing networks is growing. Currently, there is little pricing information available for the higher bandwidths, which will eventually be offered by ATM public services, such as OC12 and OC48. This is compounded by the lack of any commercially available predictive telecommunications pricing tools. When the eventual technology delivery lags the need for pricing information by several years, this lack of analytical resources makes it very difficult to predict the costs of telecommunications services acquisitions in the early stages of an acquisition, which is precisely when this information is most needed. This research project addresses that information gap with a rough-order-of-magnitude predictive pricing model for ATM public services for higher bandwidths that are not yet commercially available.

**Classification:** Unclassified

**Sponsor:** MITRE Economic and Decision Analysis Center

**Performer:** MITRE

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
			5

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Jan 97	Aug 97

**Data Base:** Proprietary

**Publications:** Internal

**Category:** II.B

**Keywords:** Industry, Estimating, Electronics/Avionics, Advanced Technology, Mathematical Modeling, Mathematical Model

**MITRE-2**

**Title:** G-Cost Model

**Summary:** The objective of this research is to create a viable SATCOM ground station cost model to support cost and acquisition planning for MITRE work programs. The work breakdown structure (WBS) consists of antenna; receiver; transmit; power; control & status (C&S); facilities; security; communication; telemetry, tracking & control (TT&C); and personnel. The WBS is supported by 25 cost drivers with 21 additional sub-cost driver options. The results are programmed into a user-friendly Excel model supported by Access database.

**Classification:** Classified

**Sponsor:** MITRE Sponsored Research

**Performer:** MITRE

<i><b>Resources:</b></i>	<i><b><u>FY</u></b></i>	<i><b><u>Dollars</u></b></i>	<i><b><u>Staff-years</u></b></i>
		\$100K	



**Schedule:**     Start                    End  
                   Jan 97                   Dec 97

**Data Base:**   Proprietary

**Publications:** None

**Category:**    II.B

**Keywords:**   Estimating, Analysis, Space Systems, Life Cycle, Risk/Uncertainty, Data Collection, Mathematical Modeling, Mathematical Model

### MITRE-3

**Title:**           Trends in the Development of Optoelectronics over the Next Ten to Fifteen Years

**Summary:**       This study examines key trends in the growth of optoelectronics on a worldwide basis, including estimates of the cost and other economic drivers that are spurring and inhibiting the development of optoelectronics over the near term future.

**Classification:** Unclassified

**Sponsor**         USGC

**Performer:**     MITRE

**Resources:**    FY                Dollars            Staff-years  
                   97               \$156,000           1.5

**Schedule:**     Start                End  
                   Oct 96            Apr 97

**Data Base:**     None

**Publications:** Optoelectronics: An Assessment Of Key Trends

**Category:**     II.D

**Keywords:**     Estimating, Analysis, Electronics/Avionics, Case Study

**RAND CORPORATION**

<b>Name</b>	RAND Corporation		
	Note: There is no formal cost research organization at RAND. Cost analysts are members of the management science group and, like all other research staff members, are assigned to projects in the various divisions (Project Air Force, Arroyo Center, National Defense Research Institute, other domestic).		
<b>Address</b>	1700 Main Street Santa Monica, CA 90407-2138		
<b>Director</b>	Frederick S. Timson, (310) 393-0411, ext. 7802		
<b>Size</b>	Professional:	8	
	Support:	0	
	Consultants:	0	
	Subcontractors:	0	
<b>Focus</b>	Force costing, O&S costing, system costing, and space systems.		
<b>Activity</b>	Number of projects in process:	3	
	Average duration of a project:	1-2 year	
	Average number of staff members assigned to a project:	1-3	
	Average number of staff-years expended per project:	0.5 to 4	
	Percentage of effort conducted by consultants:	0%	
	Percentage of effort conducted by subcontractors:	0%	

## RAND-1

**Title:** Force Structure and Support Infrastructure Costing for Program Analysis and Evaluation

**Summary:** The objective of this research is to design, develop, and implement an automated system for costing force structure and related changes in defense programs. The project will include recommendations for developing a centralized database within PA&E to support the costing system

**Classification:** Unclassified

**Sponsor:** OD(PA&E)

**Performer:** RAND  
Adele Palmer, (310) 393-0411 (Co-PI); Jim Bigelow, (310) 393-0411 (Co-PI);  
Manuel Carrillo, (310) 393-0411; Gary Massey, (310) 393-0411

**Resources:** FY      Dollars      Staff-years

**Schedule:** Start      End  
Dec 90      Continuing

**Data Base:** *Title:*  
*Description:*  
*Automation:*

**Publications:** *The Force Structure Costing Project: An Introductory Briefing*, WD-5252-PA&E, Adele Palmer, December 1990, Unclassified (distribution of RAND WDs controlled by sponsor)

**Category:** II.C

**Keywords:** Government, Estimating, Analysis, Programming, Forces, Expert System, Method, Computer Model

## RAND-2

**Title:** The Cost of Future Military Aircraft: Historical Cost Estimating Relationships and Cost Reduction Initiatives

**Summary:** The project will update three previous RAND studies involving the cost of advanced airframe materials, airframe cost estimating relationships based on historical data, and Very High Speed Electronics avionics costs. It will also assess how new industrial and management practice affect aircraft costs, survey and update operating and support cost estimating methodologies, and update electronics, propulsion, and other subsystem cost estimating methodologies. [This is a new task in FY 1998 and incorporates the Advanced Airframe Structural Materials task reported as RAND-3 in the 1997 catalog.]

**Classification:** Unclassified

**Sponsor:** SAF/AQ/FM and OD(PA&E)

**Performer:** RAND  
Points of Contact: Dr. Michael Kennedy (310) 393-0411 Ext. 7650; Jack Graser (202) 296-5000 Ext. 5293

**Resources:** FY      Dollars      Staff-years  
98-99      6 MTS

<b><i>Schedule:</i></b>	<u><i>Start</i></u>	<u><i>End</i></u>
	Jan 98	Continuing
<b><i>Data Base:</i></b>	No separate database anticipated. Reports will have CERs/adjustment factors in the body of the text, with details in appendices.	
<b><i>Publications:</i></b>	Separate RAND reports anticipated for each major area.	
<b><i>Categories:</i></b>	II.A.1, II.A.2	
<b><i>Keywords:</i></b>	Industry, Estimating, Airframe, Propulsion, Electronics/Avionics, EMD, Production, Operations and Support, Engineering, Manufacturing, Material, Acquisition Strategy, Automation, Advanced Technology, Data Collection, Survey, Statistics/Regression, Method, CER, Study	

**LOGISTICS MANAGEMENT INSTITUTE**

<b>Name</b>	Logistics Management Institute		
<b>Address</b>	2000 Corporate Ridge McLean, VA 22102-7805		
<b>Director</b>	Mr. Walter R. Cooper, (703) 917-7242		
<b>Size</b>	Professional:		9
	Support:		1
	Consultants:		0
	Subcontractors:		0
<b>Focus</b>	Infrastructure, Weapon Systems		
<b>Activity</b>	Number of projects in process:		10
	Average duration of a project:		1 year
	Average number of staff members assigned to a project:		1-2
	Average number of staff-years expended per project:		1
	Percentage of effort conducted by consultants:		0%
	Percentage of effort conducted by subcontractors:		0%

## LMI-1

**Title:** Empirical Analysis of Learning Curves

**Summary:** Reductions in scale of the Defense budget, advances in manufacturing technologies, and acquisition reform will all affect the costs of future acquisitions. The sensitivity of cost estimates to underlying assumptions becomes of greater importance during this period of transition. This task is examining these issues from an empirical perspective and is building analytical tools to assist analysts in the CAIG in preparing their independent estimates. Initially, this research program addressed tactical missiles; research is now focusing on the development of alternative models and testing those models with military electronics programs.

**Classification:** Unclassified

**Sponsor:** Weapon System Cost Analysis Division, OD (PA&E)  
Lieutenant Colonel David Nicholls, (703) 695-7282

**Performer:** LMI  
Ken Notis, (703) 917-7171; Virginia Stouffer, (703) 917-7167; Dr. David Lee, (703) 917-7557

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96	\$200K	1.0
97	\$168K	0.85

**Schedule:**

<u>Start</u>	<u>End</u>
Apr 96	Aug 98

**Data Base:** We are creating no new data bases in this project.

**Publications:** Cooper, W. R., J. S. Domin, R. M. Feinberg, J. P. Johnson, D. A. Lee, and T. P. Lyon, "Empirical Analysis of Cost Progress Curves: Tactical Missiles." LMI Report PA603T1, October 1997.

**Categories:** I.A, II.A.2, II.C, II.D

**Keywords:** Industry, Estimating, Missiles, Electronics/Avionics, Production, Manufacturing, Acquisition Strategy, Data Collection, Cost/Production Function, Statistics/Regression, Study

## LMI-2

**Title:** Improved Methodologies for Estimating Development Costs

**Summary:** This study is surveying best practices in organizing and executing programs and in estimating the costs of planned development projects for large-scale product developments in commercial and Defense industries. The effort will identify the applicability of available product development cost estimation methodologies to different DoD product sectors and recommend best practices for improving estimates of development costs for key DoD product sectors. LMI will host a series of seminars that will bring together developers and cost analysts to identify major cost drivers of today's development programs. The first seminar, scheduled for August 1998, will concentrate on development of new receivers for the Global Positioning System.

**Classification:** Unclassified

**Sponsor:** Director, Operations Analysis and Procurement Planning Division, OD (PA&E)  
Mr. Steve Miller, (703) 697-0307

**Performer:** LMI  
Gerry Belcher, (703) 917-7073; Dr. David Lee, (703) 917-7557



**Resources:**     FY             Dollars             Staff-years  
                      98             \$250K             1.3  
                      99             \$300K             1.6

**Schedule:**     Start             End  
                      Mar 98             Mar 00

**Data Base:**     No data bases will be created as a result of this work program.

**Publications:**     A final report will be published upon completion of the analyses

**Category:**     II.A

**Keywords:**     Government, Estimating, Analysis, Programming, Budgeting, Data Collection, Mathematical Modeling, Statistics/Regression

### LMI-3

**Title:**             Applying Advanced Tools for Analysis of Program Management

**Summary:**        It has been observed that well-managed research and development programs absorb resources in a pattern that appears to follow a Rayleigh probability distribution. Recently, a technique was developed to obtain probability distributions on the parameters of the Rayleigh model using multiple model adaptive estimation (MMAE). This task provides a computer model that conveniently accesses the results of MMAE and other appropriate methods for identifying Rayleigh parameters from data on programs' actual cost of work performed.

**Classification:**     Unclassified

**Sponsor:**        Deputy Director, Performance Measurement, Acquisition Program Integration, OUSD(A&T)  
                      Reed White, (703) 695-5166

**Performer:**       LMI  
                      Dr. David Lee, (703) 917-7557; John Dukovich, (703) 917-7512

**Resources:**     FY             Dollars             Staff-years  
                      97             \$50K             0.3

**Schedule:**     Start             End  
                      Jun 97             Mar 98

**Data Base:**        No new data bases were developed; however, three data tables from the Contract Analysis System (CAS) database are combined and reduced to produce a database internal to the model.

**Publications:**     Lee, D. A. and J. Dukovich, "Using the Rayleigh Analyzer: Beta Test Version." LMI Report AT701C1, March 1998.

**Category:**        II.A

**Keywords:**        Government, Estimating, Analysis, Programming, Budgeting, Data Collection, Mathematical Modeling, Statistics/Regression, Computer Model

### LMI-4

**Title:**             Enhancing Resource Analysis

**Summary:**        In an effort to advance the state of knowledge and practice in the resource analysis community, this project supported the publication of two books. The first, The Cost Analyst's Companion by Dr. David Lee, is derived from a series of lectures he presented to analysts in the OSD Cost Analysis Improvement Group (CAIG). The book addresses a number of topics important to cost analysts: cost progress curves, cost estimating relationships, advanced techniques in evaluating the costs of

development programs, and the use of engineering and statistical considerations for estimating operating and support costs. The second, The OSD Cost Analysis Improvement Group: A History, edited by Don Srull, reviews the history of the CAIG over the 25 years since it was established.

**Classification:** Unclassified

**Sponsor:** Joint between Independent Research and Development and the Deputy Director (Resource Analysis), OD(PA&E)  
Dr. Dave Gallagher, (703) 695-2612

**Performer:** LMI  
Dr. David Lee, (703) 917-7557; John Dukovich, (703) 917-7512; Don Srull, (703) 917-7235; Virginia Stouffer, (703) 917-7167

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$100K	0.5

**Schedule:**

<u>Start</u>	<u>End</u>
Aug 97	Feb 98

**Data Base:** No new data bases were developed.

**Publications:** Lee, D. A., "The Cost Analyst's Companion." The Logistics Management Institute, McLean, VA, 1997.  
Srull, D., Editor, "The Cost Analysis Improvement Group: A History." The Logistics Management Institute, McLean, VA, 1998.

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Programming, Budgeting, Data Collection, Mathematical Modeling, Statistics/Regression, Computer Model

## LMI-5

**Title:** Weapon System Total Life Cycle Costs: A Management-Oriented Cost Accounting System

**Summary:** In this study, LMI is assisting in the surveying of the Military Departments' efforts to institute activity based accounting and management by consolidating and evaluating input, focusing on those efforts directly related to weapon systems. The study is also addressing the extent to which VAMOSC and other Service-run cost of ownership initiatives may be constructive starting points for a new cost accounting system and/or its components.

**Classification:** Unclassified

**Sponsor:** Deputy Director, Performance Measurement, Acquisition Program Integration, OUSD(A&T)  
Mr. Gary Christle, (703) 695-5166

**Performer:** LMI  
John Wallace, (703) 917-7239

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$175K	0.9

**Schedule:**

<u>Start</u>	<u>End</u>
Oct 97	Oct 98

**Data Base:** No data bases will be created as a result of this work program.

**Publications:** A final report will be published upon completion of the analyses.

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Programming, Budgeting, Data Collection

**LMI-6**

**Title:** Metrics for Business Area Programming

**Summary:** The Director, Program Analysis and Evaluation has been taking steps to improve the visibility of working capital funds. For one, the office has established a requirement for the components to include business plans for selected support organizations in the Defense Program Review. This study is identifying potential performance metrics that will assist in the evaluation of these business areas. Initial focus: depot maintenance.

**Classification:** Unclassified

**Sponsor:** Director, Force and Infrastructure Cost Analysis Division, OD (PA&E).  
Commander Bill Munson, (703) 697-4311

**Performer:** LMI  
Dr. Dale Kem, (703) 917-7225; Mel Etheridge, (703) 917-7307; Ken Notis, (703) 917-7171

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$150K	0.75
98	\$200K	1.0

**Schedule:**

<u>Start</u>	<u>End</u>
Oct 97	Mar 99

**Data Base:** No data bases will be created as a result of this work program.

**Publications:** A final report will be published upon completion of the analyses

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Programming, Budgeting, Forces, Infrastructure, Fixed Costs, Variable Costs, Data Collection, Mathematical Modeling, Statistics/Regression

**LMI-7**

**Title:** Understanding the Costs of Logistic Support and Interoperability for NATO Enlargement

**Summary:** This study is addressing the costs of enlarging NATO, with special emphasis on logistics and interoperability problems and programs. The study is focusing on characterizing the current logistics support programs in the newly-invited states (Poland, Czech Republic, and Hungary), working with the three newly-invited states to identify incremental logistics support needs, and developing a framework for developing budgets to support the additional needs. The study is also investigating the implications of expanding NATO from the perspective of interoperability, especially with respect to command and control.

**Classification:** Unclassified

**Sponsor:** Regional Assessment and Modeling Division, OD (PA&E).  
Dr. Royce Kneece, (703) 695-7835

**Performer:** LMI  
Dr. Dale Kem, (703) 917-7225

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$300K	1.6

**Schedule:**     Start            End  
                   Oct 97           Oct 98

**Data Base:**    No data bases will be created as a result of this work program.

**Publications:** A final report will be published upon completion of the analyses

**Category:**     II.A

**Keywords:**    Government, Estimating, Analysis, Programming, Budgeting, Data Collection, Mathematical Modeling, Statistics/Regression

## LMI-8

**Title:**           Improving DBOF Pricing

**Summary:**       This study is providing a better understanding of the impact of various pricing problems on the resource requirements for infrastructure activities. The project will select a sample of depot-level repairables (DLRs) for each Military Service that have experienced the largest base-level repair elasticities with DBOF prices, analyze those items to determine the number and dollar value of uneconomic repair decisions, and extrapolate the sample results from each Service to the entire set of DLRs.

**Classification:** Unclassified

**Sponsor:**       Director, Force and Infrastructure Cost Analysis Division, OD (PA&E).  
                   Mr. Don Tison, (703) 695-4177

**Performer:**     LMI  
                   John Wallace, (703) 917-7239

**Resources:**     FY            Dollars        Staff-years  
                   96            \$200K           1.0

**Schedule:**       Start            End  
                   Feb 96           Sep 98

**Data Base:**       We envision publishing a data base at the end of this project

**Publications:**   A final report will be published upon completion of the analysis

**Category:**       II.A

**Keywords:**       Government, Estimating, Analysis, Programming, Budgeting, Forces, Infrastructure, Operations and Support, Fixed Costs, Variable Costs, Data Collection, Mathematical Modeling, Statistics/Regression

## LMI-9

**Title:**           Analysis of Institutional Training Resources

**Summary:**       Institutional training is a \$14 billion-a-year program in the Department of Defense. This work program is developing tools to assist senior analysts exercise their staff oversight responsibilities. The research focuses on the relationship between resources (fiscal, manpower and physical) and levels of training activity. In recent years, the focus has shifted to understanding the implications of outsourcing institutional training and on developing methods for assessing the economic impacts of investments in advanced training technologies.

**Classification:** Unclassified

**Sponsor:**       Readiness and Training Directorate, OUSD (Readiness)

Mike Kendall, (703) 697-4992

**Performer:** LMI  
Virginia Stouffer, (703) 917-7167

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
94	\$400K	2.0
95	\$250K	1.3
96	\$200K	1.0
97	\$225K	1.3

**Schedule:**

<u>Start</u>	<u>End</u>
Apr 94	Oct 98

**Data Base:** Tools under construction use several existing data bases, including training load and workload files furnished by the Defense Manpower Data Center, the FYDP, and other data bases containing information on end strengths.

**Publications:** Esmann, W. J., W. R. Cooper, and M. R. Etheridge, "Analysis of Training Installations - A System." LMI Report PR401RD1, April 1995.

Esmann, W. J., and J. Jennings, "Calculating Marine Corps Range and Maneuver-Area Requirements." LMI Report PR401LN1, November 1995.

Esmann, W. J., "Opportunities for Privatizing DoD Education and Training." LMI Report EC508LN5, October 1996.

Esmann, W. J., "A Process for Outsourcing Department of Defense Education and Training." LMI Report EC508LN1, April 1996.

Fuller, M. D., D. A. Lee, W. J. and Esmann, "Returns on Investment for Navy Enlisted Training." LMI Report FP209T1, July 1997

V. Stouffer, "A Database for Decision-Making in Training and Distributed Learning Technology." LMI Report PR702T1, April 1998.

**Category:** II.A

**Keywords:** Government, Estimating, Analysis, Programming, Budgeting, Forces, Infrastructure, Manpower/Personnel, Operations and Support, Fixed Costs, Variable Costs, Training, Data Collection, Mathematical Modeling, Statistics/Regression, Computer Model

## LMI-10

**Title:** Accrual Accounting for Post-Retirement Military Health Care

**Summary:** In this study, LMI is assisting the DoD actuary in collection, processing and analysis of data related to changes in the Military Health Services System. LMI is also assisting the Office of the Actuary in analyzing the effects of introducing the TriCare program on the demands and costs for retirement health care benefits.

**Classification:** Unclassified

**Sponsor:** Deputy Under Secretary of Defense, Program Integration, OUSD (P&R)  
Ms. Penny Westmoreland, (703) 696-4110

**Performer:** LMI  
Mel Etheridge, (703) 917-7307; Hong Le, (703) 917-7139

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$150K	.7

**Schedule:**      Start              End  
                    Oct 97              Oct 98

**Data Base:**      No data bases will be created as a result of this work program.

**Publications:**      A final report will be published upon completion of the analyses

**Category:**      II.A

**Keywords:**      Government, Estimating, Analysis, Programming, Budgeting, Data Collection, Mathematical Modeling, Statistics/Regression

**INSTITUTE FOR DEFENSE ANALYSES**

<b><i>Name</i></b>	Institute for Defense Analyses	
<b><i>Address</i></b>	1801 N Beauregard Street Alexandria, VA 22311	
<b><i>Director</i></b>	Dr. Stephen J. Balut, (703) 845-2527, E-mail: sbalut@ida.org	
<b><i>Size</i></b>	Professional:	40
	Support:	5
	Consultants:	40
	Subcontractors:	1
<b><i>Focus</i></b>	Cost of Weapon Systems, Forces and Operation	
<b><i>Activity</i></b>	Number of projects in process:	40
	Average duration of a project:	1 year
	Average number of staff members assigned to a project:	2-4
	Average number of staff-years expended per project:	2
	Percentage of effort conducted by consultants:	30%
	Percentage of effort conducted by subcontractors:	2%



## IDA-1

**Title:** Defense Resource Management Cost Model

**Summary:** Develop a computer model that permits small—to medium-size countries to estimate the funding requirements of alternative, multi-year force compositions. The model provides cost estimates that are sensitive to the following force characteristics: numbers and types of combat and support units, numbers and types of equipment, unit manning, peacetime training levels (OPTEMPO), equipment modernization, and WRM inventory changes. The model can be tailored to use the currencies, cost accounts, personnel classifications, and a wide variety of force and equipment configurations of any military force. Cost modeling provides the ability to estimate the direct and indirect personnel costs, fixed and variable operating costs, and multi-year procurement funding. Users have convenient access to all characteristics of the model so they can adjust the model's use to their own practices. Effort includes travel to foreign countries to implement the model as part of the Partnerships for Peace program.

**Classification:** Unclassified

**Sponsor:** OD(PA&E), Regional Assessment and Modeling Division  
The Pentagon, Rm. 2C270  
Washington, DC 20301  
COL Gary Morgan, (703) 697-6415

**Performer:** IDA  
Mr. James L. Wilson, (703) 845-2469

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
93	\$25,000	0.2	96	\$1,000,000	6.8
94	\$288,000	1.9	97	\$1,000,000	6.8
95	\$550,000	3.5	98	\$1,100,000	6.9

**Schedule:** Start End  
Sep 93 Indefinite

**Data Base:** None

**Publications:** DRMM Cost Modules Users Manual

**Category:** II.A.2

**Keywords:** Government, Programming, Forces, Life Cycle, Fixed Costs, Variable Costs, Mathematical Modeling, Computer Model

## IDA-2

**Title:** FYDP Tracking and Analysis System

**Summary:** This task strengthens the DoD's capability to apply FYDP data when conducting analyses in support of PPBS processes through the development of a system of computer-based analytical tools. In FY 1995 the task was changed to support the development of a new operating environment for the IDA Force Acquisition Cost System series of computer-based models.

**Classification:** Secret

**Sponsor:** OD(PA&E), Force and Infrastructure Cost Analysis Division  
The Pentagon, Rm. 2D278  
Washington, DC 20301  
Mr. Al Leung, (703) 697-4311

**Performer:** IDA

Mr. Timothy Graves, (703) 845-2339

**Resources:** FY            Dollars            Staff-years  
93            \$85,000            0.6  
94            \$150,000            1.2  
97            \$25,000            0.2

**Schedule:**    Start            End  
Jul 93            Sep 98

**Data Base:**    Title:            FYDP  
Description:    FYDP type data for all DoD programs to include Program Element  
Automation:    PC in FoxPro, Visual Basic, Excel, and Visual Basic

**Publications:**    TBD

**Categories:**    II.A.1, II.A.2, II.B

**Keywords:**      Government, Programming, Forces, Life Cycle, Acquisition Strategy, Mathematical Modeling, Computer Model

### IDA-3

**Title:**            FYDP Related Studies

**Summary:**      This task supports the conduct of studies to improve the existing FYDP-related taxonomy of missions and infrastructure and to maintain and utilize previously developed models for FYDP-related analyses.

**Classification:**    Secret

**Sponsor:**       OD(PA&E), Force and Infrastructure Cost Analysis Division  
The Pentagon, Rm. 2D278  
Washington DC 20301  
Mr. Al Leung, (703) 697-4311

**Performer:**      IDA  
Mr. Timothy J. Graves, (703) 845-2339

**Resources:**    FY            Dollars            Staff-years            FY            Dollars            Staff-years  
92            \$40,000            0.3            95            \$130,000            1.0  
93            \$220,000            2.4            96            \$150,000            1.2

**Schedule:**    Start            End  
Sep 92            Oct 99

**Data Base:**    Title:            AMORD, FYDP  
Description:    FYDP type data for all DoD programs to include Defense Mission Categories, Program Element  
Automation:

**Publications:**    TBD

**Categories:**    II.A.1, II.A.2, II.B

**Keywords:**      Government, Programming, Forces, Mathematical Modeling, Computer Model

### IDA-4

**Title:**            Defense Programming Database

**Summary:**      This task is to analyze and document the databases currently used to provide senior management and their staffs with the information necessary to make informed program

decisions, and to recommend improvements. The primary database used is the Future Years Defense Program (FYDP). Initially, support will to be provided to affect the transfer of responsibility for updating the FYDP from the Comptroller to PA&E. Following this, IDA will:

1. Formally evaluate the improvements made to the FYDP Update process that were implemented during the period when responsibility for the update was taken over by PA&E.
2. Recommend improvements to the FYDP data elements to make the database more useful for defense analyst. This work will focus on data elements that will make it possible to evaluate the effects of resource changes on readiness.
3. Recommend solutions for linking the FYDP database with other useful programming databases. In particular, this will involve reviewing the plan for integrating the data collected through the Advanced POM Preparation System (APPS) and the FYDP into the Defense Programming Database (DPD).
4. Other tasks will address a system for reporting DPD data, reviewing the current Defense Mission Category (DMC) and Infrastructure Category (IC) structures with recommendations for improving the assignments of program elements to "missions" in the IC structure. Other work will focus on the streamlining of the PPBS databases that will be a part of the DPD.

A DoD task force and the sponsor will approve products prior to implementation.

**Classification:** Unclassified work dealing with a classified database

**Sponsor:** OD(PA&E)  
1800 Defense Pentagon  
The Pentagon, Rm. 2D322  
Washington, DC 20301-1800  
Dr. Bryan Jack, (703) 693-7827

**Performer:** IDA  
Mr. Paul Goree, (703) 845-2238

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	95	\$340,000	2.2
	96	\$550,000	3.5
	97	\$475,000	2.9
	98	\$325,000	2.0

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Jun 95	May 99

**Data Base:** Title:  
Description:  
Automation: FYDP, APPS, DPD, MDAP

**Publications:** TBD

**Categories:** II.A, II.C, II.D

**Keywords:** Government, Programming, Forces, Infrastructure, Manpower/Personnel, Life Cycle, Automation, Data Collection, Data Base

## IDA-5

**Title:** Science and Technology Models

**Summary:** In 1992, the Army began the development of a management information system for the management of their Science and Technology Programs. The program, initiated under a

separate task order that helped develop the Army's S&T Master Plan, was used by the headquarters and field laboratories to manage the S&T program. The Army Science and Technology Management Information System (ASTMIS) was a distributed application that required monthly updates to data used in the headquarters to manage the program. Using the program, headquarters analyst could assess the details of Army S&T projects and their contribution toward Army objectives. The success of the program was hampered by the distributed data arrangements. Currently, the program has been redesigned and will go on-line using a central server and database. Financial and descriptive information about projects, tasks and workpackages are available for review and modification. Reports and charts are available for reviewing the data.

**Classification:** Unclassified

**Sponsor:** DDR&E (Plans and Resources)  
1800 Defense Pentagon  
The Pentagon, Rm. 3D367  
Washington, DC 20301-1800  
Mr. Robert Tuohy, (703) 693-2978

**Performer:** IDA  
Mr. Paul Goree, (703) 845-2238

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	96	\$85,000	0.5
	97	\$265,000	1.6
	98	\$75,000	0.4

**Schedule:** Start      End  
Oct 96      Sep 98

**Data Base:** **Title:** "ASTMIS"  
**Description:** The ASTMIS data base is an Access data base that contains information about the Army's S&T Program.  
**Automation:** Designed using COTS and desktop computers.

**Publications:** A users guide and model documentation will be prepared.

**Category:** II.A

**Keywords:** Programming, Budgeting, Data Collection, Computer Model, Data Base

## IDA-6

**Title:** Contingency Operations Support Tool (COST)

**Summary:** The initial estimates of the cost to support military operations in Bosnia (Operation Joint Endeavor (OJE)) have proven to be significantly low. The DoD Deployment Model, used to estimate these costs, had been successfully used to estimate costs for other contingency operations in Haiti and Somalia. Cost estimates derived in this manner for the Bosnia operations were in error by over a factor of two. The first phase of this task examined the initial and subsequent estimates in an attempt to understand why the estimates erred by this amount. Problems were observed in three areas: (1) estimating; (2) operations or policy changes; and (3) not estimated. In this phase of the task, IDA will develop the Contingency Operation Support Tool (COST) for the OSD Comptroller to aid the analyst in the preparation of both planning and detailed estimates for future contingencies. A standard cost breakdown structure will be used for estimating and reporting costs for contingency operations. A logical data model has been developed and a physical model implemented to facilitate the construction of an estimate. COST is being developed using COTS. The concept of operation makes the application and its data available to approved users via the SIPRNet. Initial or planning estimates will be prepared by the OSD (C) and

passed to the Services and Agencies where a more detailed estimate can be made. Service and Agency estimates will be passed to OUSD(C) for inclusion in the official estimate for the contingency. Trial periods will be established to verify model operations. A task goal is to secure the endorsement by the OUSD(C), Joint Staff, and Military Departments to use the application for cost estimates during all contingency operations.

**Classification:** Unclassified

**Sponsor:** OUSD (Comptroller)  
1800 Defense Pentagon  
The Pentagon, Rm. 3D868  
Washington, DC 20301-1800  
Ms. Sallie Morse, (703) 697-9317, ext. 19

**Performer:** IDA  
Mr. Paul Goree, (703) 845-2238

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$450,000	2.7
	98	\$500,000	3.1

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Dec 97	Mar 99

**Data Base:** **Title:** "COST"

**Description:** The COST database is comprised of separate physical databases the are entitled, "Cost Systems, Cost Factors and Cost Standards, and Cost Contingencies.

**Automation:** Design will use COTS and desktop computers, possibly using Web technology.

**Publications:** A users guide and model documentation will be prepared.

**Category:** II.C

**Keywords:** Government, Estimating, Forces, Life Cycle, Computer Model, CER

## IDA-7

**Title:** Trends in Weapons System O&S Costs

**Summary:** The objective of this task is to investigate available operating and support cost data to see if past efforts to reduce O&S costs have been effective. Results will be normalized, as much as possible, for changes in weapons capability, operating tempo, and economic inflation.

**Classification:** Secret

**Sponsor:** OUSD(A&T)(API)  
The Pentagon, Rm. 1E466  
Washington DC 20301  
Mr. Phil Rodgers, (703) 697-6070

**Performer:** IDA  
Mr. Timothy J. Graves, (703) 845-2239

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	96	\$100,000	0.8

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Jul 96	Jun 98

**Data Base:** **Title:** VAMOSC data, Service OPTEMPO data

**Description:** FYDP type data for all DoD programs to include Defense Mission Categories, Program Element, Procurement Annex Line Item

**Automation:**

**Publications:** "Trends in Weapons System O&S Costs", Unclassified, Draft Final, October 1997.

**Category:** II.C

**Keywords:** Government, Estimating, Forces, Life Cycle, Computer Model, CER

## IDA-8

**Title:** Operations and Maintenance (O&M) Funding Migration

**Summary:** The objective of this task is to identify the magnitude of funding shifted from investment to O&M accounts during budget formulation and execution historically and, where possible, identify the reasoning which resulted in understating of future O&M requirements. This original objective was satisfied and the QDR utilized this information to direct the services to more fully program for future O&M needs. Furthermore, the Secretary established a future investment set aside account. The new objective is to support API/AR with FYDP related studies as required.

**Classification:** Secret

**Sponsor:** OUSD(A&T)/API/AR  
The Pentagon, Rm. 1E474  
Washington, DC  
Mr. Phil Rodgers, (703) 697-6070

**Performer:** IDA  
Mr. Timothy J. Graves, (703) 845-2339

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$100,000	0.8

**Schedule:**

<u>Start</u>	<u>End</u>
Jan 97	Jun 98

**Data Base:**

**Title:** DoDSPEAR

**Description:** The DoDSPEAR (DoD Selective Program Element Analysis Report) model data base contains FYDP data by budget formulation position (POM, BES, PB) from the FY82 PB and forward.

**Automation:** FoxPro, dBASE, Visual Basic

**Publications:** None

**Categories:** II.A.1, II.A.2, II.B

**Keywords:** Government, Programming, Forces, Acquisition Strategy, Operations and Support, Mathematical Modeling, Computer Model

## IDA-9

**Title:** Assessing Defense Funding Supporting Readiness

**Summary:** Maintaining the readiness of U.S. defense forces is one of the highest budgetary priorities of the Department of Defense. In order to do this, analysts and senior defense executives must be able to evaluate defense budgets and the FYDP to determine if they provide adequate funding for the desired level of readiness. A major portion of this research is identifying and quantifying the accounting changes that have occurred in DoD funding policies over the past two decades. The research also is developing a methodology for

identifying the portions of the defense program that have the most impact on readiness and is developing alternative metrics that describe changes in defense force size.

**Classification:** Secret

**Sponsor:** Deputy Under Secretary of Defense (Readiness)  
Director for Readiness and Training  
The Pentagon, Rm. 1C757  
Washington, DC 20301  
COL Charles Mitchell, (703) 697-4992

**Performer:** IDA  
Mr. Stanley A. Horowitz, (703) 845-2450

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	95	\$300,000	1.9
	96	\$400,000	2.5
	97	\$350,000	2.2

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 94	Dec 98

**Data Base:** FYDP Funding Adjustments

**Publications:** "Normalizing the Future Years Defense Program for Funding Policy Changes," Paper P-3194, Institute for Defense Analyses, January 1997.

**Categories:** II.A.1, II.A.2, II.B

**Keywords:** Government, Programming, Forces, Acquisition Strategy, Operations and Support, Mathematical Modeling, Computer Model

## IDA-10

**Title:** Force Modernization Metrics

**Summary:** In building the Defense Program Projection, which looks at prospective defense spending twelve years beyond the end of the FYDP, tools are needed to present ways in which the force will be evolving. Building such tools is the central job of this task. In addition to tracking force age and capital asset value, attention will be devoted to developing indicators of capability for various missions and classes of systems to allow projections of capability to be made for alternative defense programs. The recapitalization of defense facilities will also be addressed.

**Classification:** Secret

**Sponsor:** Deputy Director (General Purpose Programs) Program Analysis and Evaluation  
The Pentagon, Rm. 2E330  
Washington, DC 20301  
Mr. Will Jarvis, (703) 697-9132

**Performer:** IDA  
Mr. Stanley A. Horowitz, (703) 845-2450

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$340,000	2.2
	98	\$360,000	2.3

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 96	Dec 99

**Data Base:** Equipment inventories over time and potential capability measures. Age and plant replacement value of facilities by type and location.

**Publications:** TBD  
**Categories:** II.B, II.C  
**Keywords:** Government, Analysis, Review, Policy, Programming, Forces, Life Cycle, Data Collection, Time Series, Data Base, Computer Model, Study

## IDA-11

**Title:** Non-major Procurement Funding

**Summary:** The objective of this task is to investigate available procurement data to determine the adequacy of non-major procurement funding in the FYDP and Defense Program Projection (DPP) periods and to assess the completeness and the fidelity of the MDAP supplemental data submissions. High-level relationships between non-major procurement funding levels and other FYDP funding/manpower levels have been analyzed using FY98 PB DPP data. Note: the Major Defense Acquisition Programs (MDAP) Reporting task was merged with this task in FY98.

**Classification:** Secret

**Sponsor:** OUSD(A&T)/API/AR  
 The Pentagon, Rm. 1E474  
 Washington, DC 20301  
 Mr. Steve Dratter, (703) 697-8020  
 LTC Daniel Cuda, (703) 697-1786

**Performer:** IDA  
 Mr. David A. Drake, (703) 845-2573

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$50,000	0.4
98	\$50,000	0.4

**Schedule:**

<u>Start</u>	<u>End</u>
Jan 97	Sep 98

**Data Base:**

**Title:** Min\_PROC data

**Description:** FYDP type data for all DoD Procurement programs to include Defense Mission Categories, Program Element, Procurement Annex Line Item for all procurement funding that is not in the DPP detail.

**Automation:** FoxPro, dBASE

**Publications:** TBD

**Categories:** II.A.1, II.A.2, II.B

**Keywords:** Government, Programming, Forces, Acquisition Strategy, Operations and Support, Mathematical Modeling, Statistics/Regression, Computer Model

## IDA-12

**Title:** Program Objective Memorandum (POM) Major Defense Acquisition Programs (MDAP) Reporting

**Summary:** The objective of this task is to examine the Program Element and Procurement Annex Line Item (PE-PALI) Crosstrack and RDT&E project level data reporting requirements to ensure all Major Defense Acquisition Program (MDAP) reporting requirements can be met with these data. Modifications to the reporting requirements will be proposed as necessary. Programs will be developed to process the raw data into usable formats, check for errors, and build MDAP funding profiles. MDAP reporting in the FY98 PB



supplemental submissions have been analyzed and FoxPro programs to process the raw PE-PALI Crosstrack and RDT&E project level data into desired formats have been written.

**Classification:** Secret

**Sponsor:** OUSD(A&T)/API/AR, Acquisition Resources  
The Pentagon, Rm. 1E474  
Washington, DC 20301  
Mr. Steve Dratter, (703) 697-8020

**Performer:** IDA

Mr. David A. Drake, (703) 845-2573

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$25,000	0.2

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Jan 97	Sep 98

**Data Base:** Title: MDAPs

Description: FYDP type data for all DoD RDT&E and Procurement programs to include Defense Mission Categories, Program Element, Procurement Annex Line Item, and MDAP Identifier.

Automation: FoxPro, dBASE

**Publications:** None

**Categories:** II.A.1, II.A.2, II.B

**Keywords:** Government, Programming, Forces, Acquisition Strategy, Operations and Support, Mathematical Modeling, Statistics/Regression, Computer Model

## IDA-13

**Title:** Force Aging

**Summary:** This task has four subtasks: (1) developing data bases and an aging model to assess the effects of aging force structure during the period of the Defense Program Projection; (2) performing case studies of selected weapon systems (i.e., F-16 Service Life and Resource Requirements) and types of weapon systems (i.e., vehicles and Army helicopters); (3) assessing the effects of re-engineering the B-52H; and (4) developing a facilities aging model. Relative to the data bases and tools, the initial focus has been on collecting data on equipment inventories and creating a capital stock data base. The primary case study has been on the F-16, assessing service life and resource requirements needed until the Joint Strike Fighter deploy. The next class of system to be reviewed will be tracked vehicles.

**Classification:** Secret

**Sponsor:** OD(PA&E) and USD(A&T)

**Performer:** IDA

Mr. Waynard C. Devers, (703) 845-2252

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	94	\$53,000	0.4
	95	\$200,000	1.3
	96	\$310,000	2.0
	97	\$255,000	1.6

**Schedule:**      Start                      End  
                     Jan 95                      Jun 98

**Data Base:**      Title:

Description:      Equipment data bases, including inventory, age, service life, and operating tempo by serial number for Army, Navy, Marine Corps and Air Force aircraft, combat vehicles, and selected trucks; and capital stock data base, for selected equipment. Facilities data base, including inventories by facilities categories, age, installation, plant replacement value, target replacement life, and, for selected facilities condition, and readiness codes.

Automation:      Equipment Data Base—FoxPro, Capital Stock Data Base—Excel, Facilities Data Base—FoxPro

**Publications:**      Multiple papers providing the results of case studies.

**Categories:**      I.B.1, II.B, II.C

**Keywords:**      Forces, Weapon Systems, Aircraft, Helicopters, Ships, Land Vehicles, Facilities, Life Cycle, Production, Data Collection, Mathematical Modeling, Data Base, Case Study

## IDA-14

**Title:**                      USMC Utility Rotary Wing Aircraft

**Summary:**              This task provides operating and support costs estimates for selected USMC utility rotary wing aircraft.

**Classification:**      Unclassified

**Sponsor:**              OD(PA&E)

**Performer:**              IDA

                    Mr. Waynard C. Devers, (703) 845-2252

**Resources:**      FY                      Dollars                      Staff-years  
                     96                      \$75,000                      0.5

**Schedule:**              Start                      End  
                     Nov 95                      Apr 98

**Data Base:**              Title:

Description:      Operating and support cost data bases, including inventory, operating tempo, cost drivers and cost factors for Marine Corps utility rotary wing.

Automation:      Data Base—Excel

**Publications:**      Report due at completion of study with data bases.

**Categories:**      I.B.1, II.A.1

**Keywords:**      Government, Estimating, Forces, Weapon Systems, Helicopters, Operations and Support, Data Collection, Data Base, Case Study

## IDA-15

**Title:**                      Rotary Wing Aircraft Recapitalization Analyses

**Summary:**              Concepts for future rotary wing aircraft systems envision filling the force structure using fewer platforms types. Given this, there are many possible approaches to current and planned rotary wing platforms to accommodate the eventual transition to fewer platform

types. The objective of this task is to analyze the affordability implications of various rotary wing aircraft recapitalization strategies.

**Classification:** Unclassified

**Sponsor:** Office of the Director for Force Structure, Resource and Assessment (J-8) of the Joint Staff

LTC Mark Gibson, USMC, (703) 697-6070

**Performer:** IDA

Mr. Bruce Harmon, (703) 845-2501

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	96	\$82,916	0.6
	97	\$16,854	0.1

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 95	Dec 97

**Data Base:** Title:

Description: Data and model characterizing future rotary wing aircraft inventories and investment costs.

Automation:

**Publications:** None

**Category:** II.A.2

**Keywords:** Government, Programming, Estimating, Weapon Systems, Helicopters, Acquisition Strategy, Production Rate, Cost/Production Function, Case Study

## IDA-16

**Title:** DoD Helicopter Commonality Study

**Summary:** This task has two major subtasks. (1) in support of the Marine Corps utility helicopter acquisition decision, the study provides an analysis of the costs and savings associated with the alternative approaches to achieving commonality; and (2) in support of commonality issues that may be addressed in the Quadrennial Defense Review, the study provides an assessment of utility and attack helicopter commonality issues and develops a framework for further analyses of the cost implications of commonality.

**Classification:** Unclassified

**Sponsor:** OD(PA&E)

**Performer:** IDA

Mr. Waynard C. Devers, (703) 845-2252

<b>Resources:</b>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
	97	\$200,000	1.3

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Nov 96	Jun 98

**Data Base:** None

**Publications:** Paper due at end of study that provides a framework for evaluating commonality and assesses the cost of Marine Corps utility helicopter options.

**Category:** I.B.1

**Keywords:** Government, Estimating, Analysis, Helicopters, Acquisition Strategy, Case Study

## IDA-17

**Title:** Space and Missile Systems Nuclear Hardening Costs

**Summary:** Investigate relationships between costs and technical characteristics, including nuclear-radiation hardening and other survivability features of selected military satellite and ground-based missile systems. Develop CERs to estimate the marginal costs to harden satellites and missiles against nuclear weapons effects.

**Classification:** Secret-Restricted Data, Proprietary Information

**Sponsor:** DSWA/ETD  
6801 Telegraph Road  
Alexandria, VA 22310-3398  
Mr. Michael Rooney, (703) 325-0456

**Performer:** IDA  
Dr. Daniel B. Levine, (703) 845-2562  
Dr. Robert Oliver, (703) 578-2981  
Dr. David Hunter, (703) 845-2549  
Mr. Bernard McHugh, (703) 845-6781

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
94	\$275,000	1.7
96	\$275,000	1.7
97	\$100,000	0.6
98	\$125,000	0.7

**Schedule:**

<u>Start</u>	<u>End</u>
Apr 93	Dec 98

**Data Base:** *Title:*

*Description:* Satellite cost data from the Unmanned Space Vehicle Cost Model Version 7 (USCM 7) and from collection by IDA. Missile cost data from U.S. Army and Navy sources. Satellite and missile RDT&E and production costs segregated by subsystem. Satellite and missile technical data, including performance characteristics and nuclear-hardening specifications.

*Automation:* Excel spreadsheets and Access database

**Publications:** *Estimating the Costs of Nuclear-Radiation-Hardened Military Satellites*, IDA Paper P-2857, Secret/Restricted Data, November 1994.

*Estimating the Costs of Nuclear-Radiation-Hardened-Military Satellites (Unclassified Version)*, IDA Paper P-3120, April 1996.

**Category:** II.C

**Keywords:** Government, Industry, Estimating, Space Systems, Missiles, EMD, Production, WBS, Statistics/Regression, CER, Data Collection, Data Base, Mathematical Model

## IDA-18

**Title:** Cost of Stealth

**Summary:** The objective of this task is to estimate the cost of obtaining signature reduction for tactical aircraft through (1) adaptation of experiences gained by accomplished programs; and (2) technologies that will contribute to reductions in cost or signature in the future.

**Classification:** Top Secret/Proprietary Information/Special Access

**Sponsor:** USD(A&T)  
S&TS/AW  
The Pentagon, Rm. 3E1081  
Washington, DC 20301  
Mr. Mutzelburg, (703) 695-0525

**Performer:** IDA  
Dr. J. R. Nelson, (703) 845-2571  
Mr. Bruce Harmon, (703) 845-2501  
Mr. W. Devers, (703) 845-2252  
Dr. R. Bontz, (703) 845-2240

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
prior	\$350,000	2.0
98	\$150,000	0.8

**Schedule:**

<u>Start</u>	<u>End</u>
Oct 96	Continuing

**Data Base:**

**Publications:** TBD

**Category:** II.B

**Keywords:** Government, Estimating, Analysis, Aircraft, EMD, Production, Operations and Support, Schedule, Data Collection, Data Base, Method

## IDA-19

**Title:** Affordable Multi-Missile Manufacturing (AM3)

**Summary:** IDA will support DARPA/DoD evaluation of missile industry cost reduction initiatives to be submitted in the form of Integrated Portfolio Benefit Analyses. As part of this support, IDA will provide guidance to the industry teams related to analytical ground rules and methods. IDA will comment on the realism of the proposed savings and, where appropriate, recommend adjustments. Summarized findings will be presented as a report, and will be used in the award of Phase III Factory Demonstrations.

**Classification:** Unclassified

**Sponsor:** Defense Advanced Research Projects Agency  
3701 North Fairfax Drive  
Arlington, VA 22203-1714  
Dr. Michael F. McGrath, (703) 696-2224

**Performer:** IDA  
Mr. Thomas P. Frazier, (703) 845-2132

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96	\$200,000	1.25
97	\$200,000	1.25
98	\$225,000	1.25

**Schedule:**

<u>Start</u>	<u>End</u>
Nov 95	Sep 00

**Data Base:**

**Publications:** TBD

**Categories:** I.B, I.C, II.A.1, II.A.2

**Keywords:** Industry, Estimating, Analysis, Missiles, EMD, Production, Operations and Support, Labor, Material, Overhead/Indirect, Engineering, Manufacturing, Acquisition Strategy, Automation, Integration, Data Collection, Mathematical Modeling, Statistics/Regression, Data Base, Review, CER, Study

## IDA-20

**Title:** Technical and Schedule Risk Assessments for Tactical Aircraft Programs

**Summary:** This task supports Air Warfare/Strategic and Tactical Systems in providing independent program assessments of technical and schedule risks for tactical aircraft and missiles to the OIPT (Overarching Integrated Product Team) for DAB milestone reviews. This is a continuing project.

**Classification:** Secret/Proprietary Information

**Sponsor:** USD(A&T), S&TS/AW  
The Pentagon, Rm. 3E1081  
Washington, DC 20301  
Mr. Gissendanner, (703) 695-7036

**Performer:** IDA  
Dr. J. R. Nelson, (703) 845-2571  
Mr. Bruce Harmon, (703) 845-2501

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
prior	\$450,000	2.5
98	\$50,000	0.3

**Schedule:**

<u>Start</u>	<u>End</u>
Feb 92	Continuing

**Data Base:** N/A

**Publications:** TBD

**Category:** I.C.2

**Keywords:** Government, Analysis, Aircraft, EMD, Production, Schedule, Risk/Uncertainty, Data Collection, Data Base, Method

## IDA-21

**Title:** Methods to Assess Schedules for the Strategic Defense System

**Summary:** The objective of this task is to develop methods for assessing the acquisition schedules of ballistic missile defense systems. The systems include space-based surveillance and interceptor systems, surface-based interceptor systems, and other surface-based elements.

**Classification:** Unclassified

**Sponsor:** BMDO/PDE  
The Pentagon, Rm. 1E1037  
Washington, DC  
Ms. Donna Snead, (703) 604-3584

**Performer:** IDA  
Mr. Bruce Harmon, (703) 845-2510

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
prior	\$150,000	1.0

**Schedule:**     Start            End  
                   Jan 91           Continuing

**Data Base:**    Title:  
                   Description:    Schedule and characteristic data on 26 unmanned spacecraft, 22 missile, and 51 software programs.  
                   Automation:    None

**Publications:** *Assessing Acquisition Schedules for Unmanned Spacecraft*, IDA Paper P-2766, April 1993.  
                   *Schedule Assessment Methods for Surface-Launched Interceptors*, IDA Paper P-3014, August 1995.

**Categories:**    I.C.2, II.A.2

**Keywords:**     Government, Schedule, Estimating, Method, Statistics/Regression, Space Systems, Missiles, EMD, Production

## IDA-22

**Title:**            Resource Analysis for Test and Evaluation

**Summary:**       Analysis of resources devoted to the Major Range and Test Facility Base to include operating cost, investment cost, and personnel resources. Analyses include cost comparisons of alternative approaches to developing test and evaluation capability and realigning workload within existing infrastructure. Evaluation will include identification of efficiencies in management, operations, and resource processing.

**Classification:** Top Secret

**Sponsor:**       Deputy Director  
                   Defense Test System Engineering and Evaluation (DTSEE)  
                   The Pentagon, Rm. 3D1067  
                   Washington, DC 20301  
                   Mr. John F. Gehrig, (703) 697-5552

**Performer:**     IDA  
                   Mr. Charles T. Ackerman, (703) 578-2714  
                   Mr. Dennis O. Madl, (703) 578-2718

**Resources:**     FY            Dollars       Staff-years  
                   98            \$2,000,000     12

**Schedule:**       Start            End  
                   Oct 97           Apr 99

**Data Base:**     Title:            T&E Resources  
                   Description:    Operating Cost, Investment Projects, Real Property  
                   Automation:    Hard copy, floppies or hard disk

**Publications:** *Cost Comparison of the Navy's Air Combat Environment Test and Evaluation Facility (ACETEF) and the Air Force's Electronic Combat Integrated Test (ECIT)*, IDA Paper P-2727, June 1992.  
                   *The Need for Unexploded Ordnance Remediation Technology*, IDA Document D-1527, October 1992.  
                   *Test and Evaluation Reliance - An Assessment*, IDA Document D-1829, June 1996.

**Category:**       II.A

**Keywords:** Government, Analysis, Policy, Programming, Budgeting, Infrastructure, EMD, Test and Evaluation, Operations and Support, Acquisition Strategy, Labor, Overhead/Indirect, Economic Analysis, Study, Data Base

## IDA-23

**Title:** Program Risk Analysis and Management

**Summary:** The objective of this task is to develop algorithms by which contractors may develop more reasonable risk margins for bidding on production contracts. In addition, the task will investigate mechanisms by which the government may review and monitor contractor risk estimates.

**Classification:** Unclassified

**Sponsor:** USD(A&T)  
Acquisition Program Integration  
Mr. Wayne Abba, (703) 695-5166

**Performer:** IDA  
Dr. Matthew S. Goldberg, (703) 845-2099

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
95	\$700,000	4.0
96	\$400,000	2.3

**Schedule:**

<u>Start</u>	<u>End</u>
Dec 94	Sep 98

**Data Base:** N/A

**Publications:** Final report due at end of project.

**Category:** I.C.2

**Keywords:** Industry, Government, Estimating, Review/Monitoring, Budgeting, Production, WBS, Risk/Uncertainty, Acquisition Strategy, Mathematical Modeling, Data Base, Review, Method

## IDA-24

**Title:** Evaluation of TRICARE Program Costs

**Summary:** The DoD is implementing a congressionally mandated uniform health care benefit, including an HMO option, for beneficiaries eligible for military health care. This new program, called TRICARE, is designed to improve the access to and quality of health care, while not increasing costs to either the government or covered beneficiaries. The objectives of this task are: (1) to compare the costs, both to the government and to covered beneficiaries, of the TRICARE program with those of the traditional benefit of direct care and CHAMPUS; and (2) determine the impact of TRICARE on the out-of-pocket expenses of military retirees.

**Classification:** Unclassified

**Sponsor:** OASD(HSO&R)  
The Pentagon, Rm. 1D511  
Washington, DC 20301  
Col. Jerome Luby, (703) 614-4705

**Performer:** IDA  
Dr. Philip M. Lurie, (703) 845-2118



**Resources:** FY Dollars Staff-years  
 97 \$750,000 3.5

**Schedule:** Start End  
 Oct 96 Sep 99

**Data Base:** None

**Publications:** None

**Categories:** II.A.1, II.A.2, II.B

**Keywords:** Government, Analysis, Policy, Infrastructure, Manpower/Personnel, Test and Evaluation, Variable Costs, Data Collection, Survey, Mathematical Modeling, Economic Analysis, Data Base, Study

## IDA-25

**Title:** Financial Databases of Defense Manufacturers

**Summary:** IDA has been collecting overhead and related business data on several defense companies since the early 1980s. IDA uses the data to develop statistical models that estimate future total overhead costs and its fixed and variable components by individual company. The data have also been used to analyze other DoD procurement policies, such as profit, progress payments, and reimbursement of contractor IR&D/B&P. This effort involves updating the financial databases and statistical models of six companies and establishing a new database for one company. These data will be structured to ensure consistency with earlier IDA reports and current company accounting procedures. In addition, IDA is developing an automated database for storage, retrieval, and presentation of all the data to facilitate the analytical requirements of OD Cost Analysis Improvement Group (CAIG).

**Classification:** Unclassified, Proprietary

**Sponsor:** OD(PA&E)  
 Weapon Systems Cost Analysis Division  
 The Pentagon, Rm. 2C310  
 Washington, DC 20301  
 Mr. Gary Pennett, (703) 695-7282

**Performer:** IDA  
 Mr. John Cloos, (703) 845-2506

**Resources:** FY Dollars Staff-years  
 96 \$100,000  
 97 \$0  
 98 \$0  
 99 \$100,000

**Schedule:** Start End  
 94 98

**Data Base:** Normalized Contractor Account Pools

**Publications:** Numerous company reports and studies.

**Categories:** II.A.1, II.A.2

**Keywords:** Industry, Estimating, Analysis, Aircraft, Airframe, EMD, Production, Overhead/Indirect, Manufacturing, Fixed Costs, Variable Costs, Data Collection, Survey, Economic Analysis, Statistics/Regression, Data Base

**IDA-26**

**Title:** Economic Drivers of Defense Overhead Costs

**Summary:** The objective of this task is to identify the economic and regulatory factors that drive the overhead costs charged by defense firms. A theoretical model of overhead costs from an economic framework will be developed. The model will be used to analyze the relationship of economic factors and DoD regulations on contractor overhead costs under current business practices. The model will also assess how changes in DoD regulations impact the balance of economic forces.

**Classification:** Unclassified/Company Proprietary

**Sponsor:** OD(PA&E)  
The Pentagon, Rm. 1D311  
Washington, DC 20301  
Ms. Kristine Kolesar, (703) 697-2999

**Performer:** IDA  
Dr. Thomas Frazier, (703) 845-2132  
Dr. Maria Borga, (703) 845-2448524  
Dr. Bill Rogerson, (847) 491-8484

**Resources:** FY            Dollars            Staff-years  
95                \$250,000  
96                \$250,000

**Schedule:** Start            End  
Apr 95           Sep 99

**Data Base:** **Title:** IDA's Defense Contractor Overhead Data Base, Contractor Cost Data Reports  
  
**Description:**  
**Automation:** TBD

**Publications:** *Renegotiation of Fixed Price Contracts on the F-16 Program*, IDA Paper P-3286, December 1996.

**Category:** II.C

**Keywords:** Industry, Government, Estimating, Overhead/Indirect, Economic Analysis, Study

**IDA-27**

**Title:** DSAMS Cost Estimating

**Summary:** The Defense Security Assistance Agency (DSAA) is responsible for foreign military sales which includes the sale of weapon systems and replacement parts to foreign nations, and for the training of military and civilian personnel from foreign nations. A major project at DSAA is the migration, integration, upgrade and replacement of 12 legacy systems to support the management of foreign military sales. This project, the Defense Security Assistance Management System (DSAMS), will replace twelve existing, MILDEP-specific, redundant systems which are up to twenty years old and which cost a total of about \$36.5M per year to operate. Existing cost estimates to complete DSAMS need revision because some of the assumptions on which they were based have changed. Therefore, the DSAA requires a new and independent estimate of the cost, schedule and benefit analysis to complete the DSAMS project. The objective of this task is to provide an independent cost, schedule and benefit analysis estimate for design, development and implementation of DSAMS.

**Classification:** Unclassified

**Sponsor:** Defense Security Assistance Agency  
DSAA Comptroller  
Mr. Jim Pollitt, (703) 604-6586

**Performer:** IDA  
Dr. Thomas P. Frazier, (703) 845-2132  
Dr. John Bailey, (703) 855-4472

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
97	\$85,000	0.5

**Schedule:**

<u>Start</u>	<u>End</u>
Jul 97	Mar 98

**Data Base:**

**Publications:** TBD

**Category:** I.C.2

**Keywords:** Government, Estimating, Automation, Software, Study

## IDA-28

**Title:** Active/Reserve Integration

**Summary:** This work is designed to examine alternative ways to integrate active and reserve forces, particularly in the Army. For Army National Guard combat units, a key aspect of successful integration is being able to mobilize, train, and deploy for combat fast enough to effectively carry out its combat mission. The great uncertainty surrounding how long it would take Guard brigades and divisions to deploy has led this subject to be the focus of work on the task.

**Classification:** Unclassified

**Sponsor:** Assistant Secretary of Defense (Reserve Affairs)  
The Pentagon, Rm. 2E515  
Washington, DC 20301  
Mr. Joel Resnick, (703) 695-7305

**Performer:** IDA  
Mr. Stanley A. Horowitz, (703) 845-2450

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
96	\$175,000	1.0
97	\$250,000	1.4
98	\$300,000	1.6

**Schedule:**

<u>Start</u>	<u>End</u>
Jan 96	Dec 97

**Data Base:**

**Title:**

**Description:** Plan for mobilization, training, and deployment of a National Guard armored division.

**Automation:** Microcomputer zip drive

**Publications:** *Conference on Force Integration: Seeking Better Reserve Component Capability and Credibility*, Institute for Defense Analyses, Document D-1849, May 1996.  
*Detachment 1, 28th Infantry Division Artillery in Bosnia*, Document D-2083, Institute for Defense Analyses, Draft Final, December 1997.

**Category:** II.C  
**Keywords:** Government, Analysis, Policy, Manpower/Personnel, Readiness, Data Collection, Data Base, Study

## IDA-29

**Title:** Reducing Defense Infrastructure Costs

**Summary:** This project is designed to find better strategies for managing infrastructure, and thus reducing infrastructure costs. The initial focus is on installation support costs. Service initiatives for developing benchmarks involving the costs and output of different installation support services are being examined. Private sector and other governmental practices are also being studied. The goal is to recommend adoption of an information system and a set of metrics that will allow decision-makers more insight into how to provide the needed installation support at a reduced cost.

**Classification:** Unclassified

**Sponsor:** Director, Program Analysis and Evaluation  
The Pentagon, Rm. 3E836  
Washington, DC 20301  
COL Ambrose Hock, (703) 697-4311

**Performer:** IDA  
Mr. Stanley A. Horowitz, (703) 845-2450

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$300,000	1.6

**Schedule:**

<u>Start</u>	<u>End</u>
Feb 98	Jun 99

**Data Base:** TBD

**Publications:** TBD

**Category:** II.C

**Keywords:** Government, Analysis, Policy, Infrastructure, Facilities, Overhead/Indirect, Data Collection, Cost/Production Function, Study

## IDA-30

**Title:** Environmental Costs, Unexploded Ordnance Remediation

**Summary:** The objective of this task is to identify the cost drivers in the remediation of unexploded ordnance from Department of Defense (DoD) lands. This information will enable the DoD to conduct payback analysis on the introduction of new technology into the remediation process, determine the appropriateness of fixed cost contracts for cleanup, and determine a rational basis for deciding whether or not to attempt to remediate contaminated lands.

**Classification:** Unclassified

**Sponsor:** IDA Central Research Project

**Performer:** IDA  
Ms. Christine J. Crabill, (703) 578-2716

**Resources:**     FY             Dollars             Staff-years  
                      97             \$15,000             0.2  
                      98             \$5,000             0.1

**Schedule:**     Start             End  
                      Oct 96             Sep 98

**Data Base:**

**Publications:**     TBD

**Category:**        I.D

**Keywords:**        Government, Analysis, Facilities, Environment, Study

## IDA-31

**Title:**             Defense Economic Planning and Projection Systems (DEPPS)

**Summary:**        Maintain the currency of the Defense Translator within DEPPS by periodically updating the various sections of the translator associated with the appropriations accounts. The Defense Translator accounts for the distribution of defense spending among the industries producing the goods and services that DoD buys, and describes the commodity composition of defense demands.

**Classification:**    Unclassified

**Sponsor:**        OD(PA&E)/RA/EARPD  
                      The Pentagon, Rm. 2D300  
                      Washington, DC 20301  
                      Mr. Paul Dickens, (703) 697-2999

**Performer:**        IDA  
                      Dr. Thomas Frazier, (703) 845-2132  
                      Mr. Jeff Card, (703) 845-2212

**Resources:**     FY             Dollars             Staff-years  
                      85             \$122,000             1.0  
                      87             \$182,000             1.5  
                      88             \$40,000             0.3  
                      90             \$75,000             0.6  
                      92             \$60,000             0.5  
                      93             \$80,000             0.7  
                      94             \$160,000             1.1  
                      97             \$30,000             0.2

**Schedule:**        Start             End  
                      Jul 85             Dec 98

**Data Base:**        N/A

**Publications:**    *A Comparison of the DEIMS and the Department of Commerce Translator Vectors*, IDA Paper P-2647, T. P. Frazier, S. K. Welman, and R. H. White, March 1993, Unclassified.  
                      *A User's Manual for the Revised Defense Translator Model*, IDA Document D-796, T. P. Frazier and J. B. Tate, June 1990, Unclassified.  
                      *The Revised Defense Translator*, IDA Paper P-2141, T. P. Frazier, C. G. Campbell, and R. T. Cheslow, October 1989, Unclassified.

**Categories:**        II.A.1, II.A.2

**Keywords:**        Industry, Government, Analysis, Budgeting, Mathematical Modeling, Economic Analysis, Study

**IDA-32**

**Title:** Coast Guard Models

**Summary:** Analyze the Coast Guard's needs for cost models to support the full spectrum of its cost-estimating needs. Survey the staff of Coast Guard headquarters and examine governing federal and Department of Transportation requirements to develop a statement of cost-modeling requirements. Develop a cost estimating framework that provides a standard Coast Guard structure. Design, prototype, and develop a project oriented, life-cycle cost model that meets the Coast Guard's requirements for developing cost estimates for Planning Proposals prepared by field activities and program change analyses typically performed by Headquarters organizations.

**Classification:** Unclassified

**Sponsor:** U.S. Coast Guard Research and Development Center  
1082 Shennecossett Road  
Groton, CT  
Mr. Clark Prichett, (203) 441-2653

**Performer:** IDA  
Mr. James L. Wilson, (703) 845-2469

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>	<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
93	\$10,000	0.1	96	\$100,000	0.6
94	\$75,000	0.5	97	\$190,000	1.1
95	\$280,000	1.8	98	\$205,000	1.2

**Schedule:**

<u>Start</u>	<u>End</u>
Jul 93	Dec 98

**Data Base:** None

**Publications:** Pending

**Categories:** II.C, II.D

**Keywords:** Government, Estimating, Life Cycle, Fixed Costs, Variable Costs, Mathematical Modeling, Computer Model

**IDA-33**

**Title:** Cost Analysis Education

**Summary:** IDA collaborated with George Mason University(GMU) in the development and conduct of a graduate-level course in cost analysis during the past six years. This course is one of two core courses in GMU's Military Operations Research curriculum. Course content is focused on the daily problems confronted by defense cost analysts and approaches to solve them. Government employees are invited to attend lectures free of charge. This project supports the development and updating of lecture materials by IDA cost analysts.

**Classification:** Unclassified

**Sponsor:** IDA Central Research Program

**Performer:** IDA  
Dr. Stephen Balut, (703) 845-2527

**Resources:**

<u>FY</u>	<u>Dollars</u>	<u>Staff-years</u>
98	\$15,000	0.1

<b>Schedule:</b>	<u>Start</u>	<u>End</u>
	Oct 97	May 98
<b>Data Base:</b>	None	
<b>Publications:</b>	None	
<b>Category:</b>	II.A.1	
<b>Keywords:</b>	Government, Analysis, Forces, Weapon Systems, Review	

- [1] DoD Directive 5000.4, "OSD Cost Analysis Improvement Group (CAIG)." November 24, 1992.
- [2] Stephen J. Balut and Kathryn L. Wilson. "The IDA Cost Research Symposium." Institute for Defense Analyses, Document D-647, August 1989.
- [3] Stephen J. Balut and Kathryn L. Wilson. "1990 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-828, August 1990.
- [4] Stephen J. Balut and Kathryn L. Wilson. "The 1991 Cost Research Symposium." Institute for Defense Analyses, Document D-1003, July 1991.
- [5] Stephen J. Balut. "The 1992 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1204, August 1992.
- [6] Stephen J. Balut. "The 1993 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1414, August 1993.
- [7] Stephen J. Balut. "The 1994 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1569, August 1994.
- [8] Stephen J. Balut. "The 1995 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1754, August 1995.
- [9] Stephen J. Balut. "The 1996 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-1863, August 1996.
- [10] Stephen J. Balut. "The 1997 IDA Cost Research Symposium." Institute for Defense Analyses, Document D-2025, July 1997.
- [11] Office of the Assistant Secretary of Defense (Program Analysis and Evaluation). "DoD Six-Year Cost Research Plan, FY 1993-1998." AD-B170946, 4 January 1993.
- [12] Office of the Director, Program Analysis and Evaluation. "Interim DoD Six-Year Cost Research Plan, FY 1994-99." 4 May 1993.
- [13] Stephen J. Balut, Vance Gordon, Theresa O'Brien, Richard Bishop, and Richard Collins. "Status of DoD's Capability to Estimate the Costs of Weapon Systems." Institute for Defense Analyses, Document D-2149, April 1998.



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<b>REPORT DOCUMENTATION PAGE</b>			<i>Form Approved</i> <i>OMB No. 0704-0188</i>	
<small>Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 2220-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.</small>				
<b>1. AGENCY USE ONLY (Leave blank)</b>		<b>2. REPORT DATE</b> August 1998	<b>3. REPORT TYPE AND DATES COVERED</b> Final Report, Aug 97-Aug 98	
<b>4. TITLE AND SUBTITLE</b> "The 1998 IDA Cost Research Symposium"			<b>5. FUNDING NUMBERS</b>  DASW01 94C 0054/DASW01 97 C 0056  T-Q7-1138 & CRP 9001-702	
<b>6. AUTHOR(S)</b> Stephen J. Balut				
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Institute for Defense Analyses 1801 N. Beauregard Street Alexandria, VA 22311-1772			<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>  IDA Document D-2173	
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> Dr. Vance Gordon OSD(PA&E) Room 2E314, The Pentagon Washington, DC 20301			<b>10. SPONSORING/MONITORING AGENCY REPORT NUMBER</b>	
<b>11. SUPPLEMENTARY NOTES</b>				
<b>12A. DISTRIBUTION/AVAILABILITY STATEMENT</b> Approved for public release; distribution unlimited.			<b>12B. DISTRIBUTION CODE</b>	
<b>13. ABSTRACT (Maximum 200 words)</b> This document contains a catalog of cost research projects discussed at the IDA Cost Research Symposium held on 21 May 1998. Participants included representatives of offices and organizations that sponsor and conduct the research. The purpose of this annual symposium is to facilitate the exchange of research findings and other information in order to avoid wasteful duplication of effort and enhance each organization's ability to conduct research planning for the future. Each project summary included in this document presents the project title, a descriptive summary, classification, sponsor, performer, researchers, schedule, data bases, publications, and keywords. The research directors of the offices and organizations that participated report that catalogs associated with prior symposia (1989 through 1997) have been useful in facilitating the exchange of data, data sources, findings, and reports, thereby contributing to improved efficiency in the cost analysis function within the Department of Defense.				
<b>14. SUBJECT TERMS</b> Cost Analysis			<b>15. NUMBER OF PAGES</b> 249	
			<b>16. PRICE CODE</b>	
<b>17. SECURITY CLASSIFICATION OF REPORT</b> Unclassified	<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> Unclassified	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b> Unclassified		<b>20. LIMITATION OF ABSTRACT</b> SAR

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)  
Prescribed by ANSI Std. Z39-18  
298-102**UNCLASSIFIED**